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CAUSALGIC STATES IN PEACE AND WAR

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CHICAGO

There is an urgent need for the redefinition of causalgia. Burning pain associated with edema, glossy skin and a local rise in temperature is well known to follow certain partial injuries of the major nerve trunks. This group requires less attention because it is readily recognized and because its existence is not contested since the classic description of Weir Mitchell.[1] Far more important, however, is another large group in which the origin and level of sensory stimulation is not frankly obvious. Such patients are frequently misunderstood or discredited [2] but should be differentiated from patients suffering from purely psychogenic disorders, which occur after trauma following industrial accidents or war injuries.

It is well to look on the sensory pathways as being susceptible of stimulation at any level [3] (fig. 1). Our cases have been classified accordingly (table 1). Peripheral trauma activates the first, lowest neuron, producing vasomotor reflexes which under certain conditions are predominantly vasodilator.[4] The stimulation of posterior root fibers is known to produce painful vasodilator substances, which are diffusible and which readily produce glove or stocking type of cutaneous hyperalgesia, confusing an orthodox neurologic examination. Miller and I [5] showed that such a state is characterized by an increased blood flow as measured by a special plethysmograph. But for a clinical examination the rise in skin temperatures and the increased pulsations can differentiate such a limb from a hysterical one.

Such a first neuron lesion is encountered in any injury of the extremities in which peripheral nerves are contused, concussed or overstretched.[6] While the causalgias following injuries to the median and sciatic nerves are obvious, many other lesions have not been sufficiently emphasized. Attention should be called to lesions of the dorsal interosseous nerve in Colles' fracture, to a stretch of the peroneal or saphenous nerves in ankle sprains, to the irritation of the plantar nerve in painful lesions of the foot. Such lesions are not sufficient to produce anesthesia of the skin, and the hyperalgesia is purely subjective; however, a rise in cutaneous temperature and a cessation of sweating is often helpful in mapping out a sensory distribution before the hyperesthesia becomes diffuse.

If an injury causing continuous sensory stimulation is capable of producing such neurovascular phenomena, other conditions affecting the sensory pathways between the dorsal root ganglion and the peripheral receptors should also produce identical phenomena. In this material one of the glomus tumors, a glucose injection at the elbow producing irritation of the median nerve, a herpes zoster, an apical tumor of the lung infiltrating the intervertebral foramens or a paravertebral alcohol injection have demonstrated that they are capable of producing the causalgic state of burning vasodilatation, increased heat production, edema and osteoporosis (table 2).

Recognition of a lesion of the second neuron is not difficult when other localizing signs are present. That poliomyelitis is often very painful is sufficiently known; when the virus invades the internuncial neurons [7] the muscular hypertonus and the reflex hyperirritability of the poliomyelitic limb is readily understood. Such extremities, just like those in tabes, in combined degeneration of the cord or in an acute postscarlatinal myelitis, have shown burning pain, increased heat and edema (table 3).

While such lesions are of neurologic interest, their real significance lies elsewhere. The first neuron lesion, if unrecognized or mistreated, may ascend to this level and produce the same diffuse intractable dysesthesia, with mirror images to contralateral, symmetrical areas. Livingston [2] has postulated that the internuncial neurons become hyperirritable in the presence of persistent peripheral impulses. That the sensory barrage does produce chemical and electrical phenomena in the cord is documented by good evidence.[8] Such a cord is then comparable to that of the experimental animal whose cord has been touched with strychnine.[9]

Sensory phenomena after lesions of the highest third neuron are not unknown. Cortical trauma, the infarcted cortex with an intractably painful hemiplegia and certain cortical tumors do produce painful vasomotor

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1. Mitchell, S. W.: Injuries of Nerves and Their Consequences, Philadelphia, J. B. Lippincott & Co., 1872.

2. Livingston, W. K.: Pain Mechanisms: A Physiologic Interpretation of Causalgia and Its Related States, New York, Macmillan Company, 1943.

3. Wilson, K.: Dysesthesiae and Their Neural Correlates, Brain **50:** 428, 1927.

4. Bayliss, W. M.: Reciprocal Innervation in Vasomotor Reflexes and the Action of Strychnine and Chloroform Thereon, Proc. Roy. Soc., London, s. B **80:** 329, 1908.

5. Miller, D. S., and de Takats, G.: Post-Traumatic Dystrophy of the Extremities, Surg., Gynec. & Obst. **75:** 558, 1942.

6. Turner, H.: Ueber Nervenschädigungen beim typischen Radiusbruch, Arch. f. klin. Chir. **128:** 422, 1924. Abbott, L. C., and Saunders, J. B. de C. M.: Injuries of the Median Nerve in Fractures of the Lower End of the Radius, Surg., Gynec. & Obst. **57:** 507, 1933. Isenschmid, R., and Rieben, G.: Schädigungen des Nervus ischiadicus bei traumatischer Luxation des Hüftgelenkes, Schweiz. med. Wchnschr. **71:** 137, 1941. Hyslop, G. H.: Injuries to the Deep and Superficial Peroneal Nerves Complicating Ankle Sprain, Am. J. Surg. **51:** 436, 1941.

7. Kabat, H., and Knapp, M. E.: The Mechanism of Muscle Spasm in Poliomyelitis, J. Pediat. **24:** 123, 1944.

8. Nachmansohn, D.: La transmission de l'influx nerveux dans le système nerveux central, Compt. rend. Soc. de biol. **126:** 783, 1937.

9. Dusser de Barenne, J. G.: Die Strychninwirkung auf das Zentralnervensystem: II. Zur Wirkung des Strychnins bei lokaler Applikation auf das Rückenmark, Folia neuro-biol. **5:** 42, 1910.

phenomena not unlike causalgia.[10] Again the fact must be kept in mind that, originating from lower sensory levels, the barrage of continuous impulses may so stamp their impression on the sensory cortex that it becomes the seat of projected, self-propelled impulses to the periphery. The typical example of this is the phantom

TABLE 1.—*A Study of 54 Cases of Causalgic States*

Lesion	Number of Cases
First neuron	36
Second neuron	12
Third neuron	6
Total	54

TABLE 2.—*Lesions of the First Sensory Neuron*

Initial Trauma	Number of Cases
Blunt injury to toes or dorsum of foot	2
Sprained ankle	8
Dislocated ankle	1
Ankle sprain and fractured fibula	2
Crushed finger	2
Fractured navicular bone	1
Blunt injury to dorsum of hand	2
Wrist sprain (wringer injury)	3
Colles' fracture	6
Glomus tumor	1
Periphlebitis	4
Lymphangitis of arm	1
Tumor of apex of lung	2
Paravertebral injection of alcohol	1
Total	36

limb, but many other types of peripheral trauma can be cited which finally reach a cortical level. In our material 6 patients have reached such a state from trauma in the extremities. One committed suicide, 2 are in institutions, 3 are addicted to morphine (table 4).

TREATMENT

The value of such segmentation of sensory neurons lies in the ability of selecting the proper level of attack for treatment. The early causalgic state, characterized

TABLE 3.—*Lesions of the Second Sensory Neuron*

Lesion	Number of Cases
Poliomyelitis	5
Tabes	3
Combined degeneration of the cord	1
Syringomyelia	1
Acute postscarlatinal myelitis	1
Apoplexy of cauda equina	1
Total	12

TABLE 4.—*Lesions of the Third Sensory Neuron*

Lesion	Number of Cases
Phantom limb pain	4
Brachial plexus injury	1
Cerebral thrombosis	1
Total	6

by burning, throbbing pain relieved by suprasystolic compression of the limb, by elevation, by cooling or by moisture, is still localized to the area of stimulation. When the site of trauma, a digit, the ankle the wrist, is thoroughly infiltrated with 1 per cent procaine, not only are the sensory stimuli blocked but the secretion of the vasodilator substances is inhibited. Even though the anesthesia wears off shortly, the nonmyelinated fibers, which seem to be involved, are still paralyzed, since they are much more sensitive to procaine than the large myelinated sensory fibers.[11] The release of the protective muscle spasm, splinting the painful area, also adds to the relief from pain and allows early motion. If local infiltration fails to relieve the pain projected to that area, the stimulus has progressed to a higher level. If infiltration of an amputation neuroma does not relieve the painful stump or the phantom limb, a local excision is certainly not going to be of any benefit.

In the stage of a spreading neuralgia with which osteoporosis is frequently associated a block of the paravertebral sympathetics is advisable (figs. 2 and 3). It is surprising how much relief can be obtained in causalgias in this second stage of spreading hyperalgesia by repeated sympathetic block. In previous articles we [12] discussed the mechanisms whereby a block of the sympathetics which in itself produces vasodilatation is capable of relieving the painful vasodilatation of causalgia. All that can be said with assurance is that the causalgic type of vasodilatation is different from the one produced by heat, vasodilators or sympathetic block. It combines an increased pulse volume with an increased

TABLE 5.—*Results of Treatment of First Neuron Lesions*

Type of Treatment	Number of Cases	Recovery *		
		Complete	Partial	None
Cast, physical therapy	10	1	3	6
Repeated procaine block	4	3	1	..
Repeated sympathetic block	8	7	1	..
Periarterial sympathectomy	3	2	1	..
Perivenous stripping	2	2	..	..
Sympathetic ganglionectomy	9	6	3	..
Total	36	21	9	6

* In reanalyzing the results obtained in former years, when a definite grading of the level of sensory irritation was not made, it is obvious that failure of recovery was invariably due to irreversible contractures or to a higher sensory level.

peripheral resistance, and sympathetic block abolishes this incoordination of vasomotor impulses (fig. 4).

As Homans [13] pointed out, such repeated paravertebral blocks are capable of relieving the syndrome, but should it recur shortly after the block a sympathectomy, providing loss of vasomotor tone, is indicated.

My experience with sympathectomy in causalgia has not been extensive; it seems especially useful in the painful amputation stump when local infiltration does not help. Sympathetic interruption has helped to relieve the burning pain even in the presence of a lesion of the second neuron, suggesting that the pain, just as in the peripheral traumatic lesions, is due to a secretion of painful substances which the improved circulation is capable of neutralizing. Gesell and his associates [14] have shown how tissue acidity modifies nervous impulses by inhibiting the destruction of acetylcholine.

If sympathetic block fails to relieve the pain, sympathectomy should certainly not be undertaken. Posterior root section is not only mutilating but a dangerous procedure, since it adds the syndrome of "anesthesia dolorosa" to the causalgic state (table 5).

10. Michelsen, J. J.: Subjective Disturbances of the Sense of Pain from Lesions of the Cerebral Cortex, A. Research Nerv. & Ment. Dis., Proc. (1942) **23**: 86, 1943.

11. Gasser, H. S.: The Control of Excitation in the Nervous System, in Harvey Lectures, Baltimore, Williams & Wilkins Company, 1937, vol. 32, p. 169.

12. de Takats, G., and Miller, D. S.: Post-Traumatic Dystrophy of the Extremities: A Chronic Vasodilator Mechanism, Arch. Surg. **46**: 469 (April) 1943. de Takats.[24]

13. Homans, J.: Minor Causalgia: A Hyperesthetic Neurovascular Syndrome, New England J. Med. **222**: 870, 1940.

14. Gesell, R.; Brassfield, C. R., and Hamilton, H. A.: An Acid, Neurohumoral Mechanism of Nerve Cell Activation, Am. J. Physiol. **136**: 604, 1942.

Cutting of the spinothalamic tract (chordotomy) seems the logical procedure for a lesion of the second neuron. There can be no question of the relief it provides in painful lesions of the lower extremity unless the pain has become a psychic projection of the cortex. This may be the reason why Bailey and Moersch [15] could not register any relief in their cases. There is insufficient experience as yet with chordotomies for the arm, although Stookey [16] has recently reported having done sixteen high cervical chordotomies for relief of pain in the arm and upper chest due to mammary carcinoma. No cases of causalgia are included.

The important question arises whether or not one can localize the level of sensory irritation by certain nerve blocks. In White's case of a right parietofrontal meningioma the opposite arm exhibited excruciating pain following operation. A brachial plexus block resulting in complete motor and sensory anesthesia did not reduce the pain. Such a procedure can readily differentate a painful syndrome of the first neuron from that of the third neuron. But the fact that a spinal anesthesia fails to abolish the pain from a phantom foot does not mean that sympathectomy will not help.

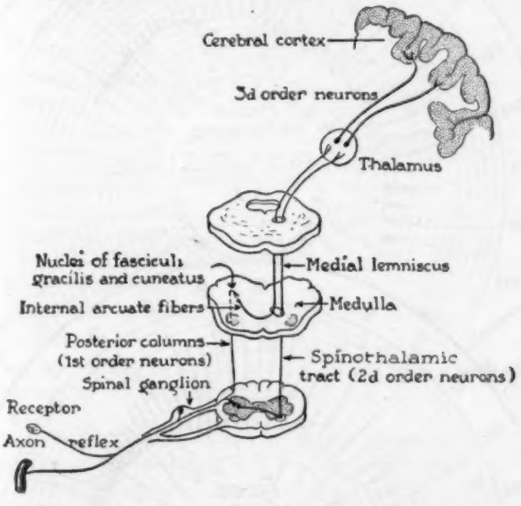

Fig. 1.—Diagram of three sensory neurons. The peripheral (first) neuron has its ganglion cell in the posterior root ganglion. The peripheral processes form the sensory fibers of the sensory nerves ending in special receptors in skin, muscle, tendon. The central processes pass through the dorsal roots into spinal columns, where they synapse with second order neurons. The spinothalamic tract constitutes the second order neuron connecting in the thalamus with the highest, third order neuron. Modified from McDonald, J. J., and Lange, J.: Correlative Neuroanatomy, ed. 2, Chicago, University Medical Publishers, 1939. Obviously, if pain persists after a procaine block of the first neuron, the irritative sensory lesion is at a higher sensory level.

This was the case in a man aged 53 with arteriosclerosis who lost his right leg in January 1943 and has had increasing pain in the phantom foot ever since. In January 1944 his left leg was amputated in my service at the Research and Educational Hospitals. Fifteen months after the first and three months after the second amputatioin he had bilateral phantom limb pain. The pain following the second amputation could be abolished by two infiltrations of procaine into a trigger zone. The pain following the first amputation, which kept him awake nights and culminated in attacks of stump epilepsy, could not be relieved by local infiltration or by spinal anesthesia to the level of the ninth dorsal. However, sympathetic block followed by lumbar sympathectomy completely freed him of pain on the right side.

15. Bailey, A. A., and Moersch, F. P.: Phantom Limb, Canad. M. A. J. **45**: 37, 1941.
16. Stookey, B.: The Management of Intractable Pain by Chordotomy, A. Research Nerv. & Ment. Dis., Proc. (1942) **23**: 416, 1943.

If local infiltration, peripheral nerve block, sympathetic block and spinal anesthesia fail to relieve the causalgic pain, there remains a selection of tractotomies at different levels of the central nervous system. In a recent communication on pain after amputation, Capt. James C. White has enumerated these central pro-

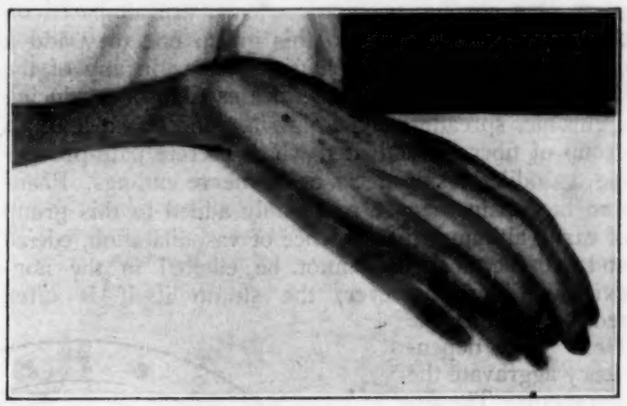

Fig. 2.—Case of H. L., a woman aged 24, a musician, who fell on the dorsum of her right hand while skating. No fracture or dislocation occurred. Burning, intractable pain was present from the start. She received much splinting, physical therapy and forced manipulation. Sympathetic blocks were started many months after the injury. This is the appearance of her right hand when first seen four years after the injury. The extensor muscles were so atrophic that active dorsiflexion was impossible, although the muscle reacted well to electrical stimulation. All the joints of the fingers were ankylosed in extension. The hand was cold and useless; it could be subjected to physical therapy only under the protection of a brachial plexus block. Functional recovery is not to be expected. Psychotherapy with rehabilitation is now under way.

cedures.[17] Walker [18] has given an illuminating description of the levels at which pain may be integrated in the cortex. The highest level is in the cortex, the second in the thalamus and the lowest at the tectum mesencephali. Mention should be made of Mahoney's bril-

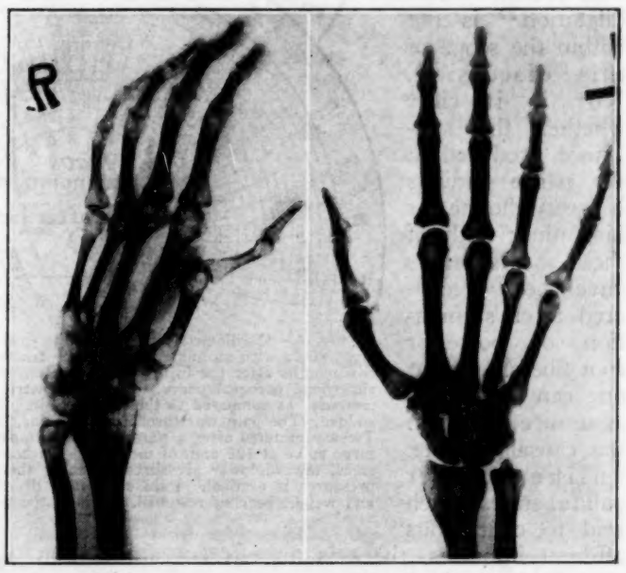

Fig. 3.—The affected right hand, with a control film of the left hand. Note the severe, spotty osteoporosis, showing some coarse trabeculation as an indication that the recalcification is under way. The joint spaces are narrow or obliterated. The atrophy of the ulnar extensors resulted in a deviation of the hand toward the radial side. The thumb shows a subluxation. It was not injured originally.

liant result with a phantom arm following the resection of the postcentral gyrus in December 1941. The relief persists to date.[19]

17. White, J. C.: Pain After Amputation and Its Treatment, J. A. M. A. **124**: 1030 (April 8) 1944.
18. Walker, A. E.: Central Representation of Pain, A. Research Nerv. & Ment. Dis., Proc. (1942) **23**: 63, 1943.
19. Mahoney, W. de G.: The Treatment of Painful Phantom Limb by Removal of Postcentral Cortex, J. Neurosurg. **1**: 156, 1944.

COMMENT

The puzzling vasomotor and trophic phenomena following the irritation of sensory pathways have been described in the past under a great many names. It has been previously pointed out [20] that Sudeck's atrophy, traumatic osteoporosis, peripheral trophoneurosis, reflex dystrophy, chronic traumatic edema, are all based on the same mechanism. To this group one may add a nontraumatic group of irritative lesions in any of the three sensory neurons, which are capable of producing a chronic, spreading hyperalgesia. In such a lesion a group of fibers is activated which secrete pain-producing, vasodilator substances at the nerve endings. Phantom limb pain may be reasonably added to this group of cases, although the evidence of vasodilatation, edema and trophic changes cannot be elicited in the nonexisting limb; however, the stump itself is often red, hot and tender. Heat and dependency aggravate the symptoms. The patient keeps his stump elevated and uncovered.[21] Whether the activated fibers are ordinary sensory fibers conducting in the opposite, efferent direction [4] or whether it is necessary to postulate a special set of posterior root fibers that produce vasodilatation [22] is not within the scope of this discussion. Nor is it clear whether the substance produced at the nerve endings is acetylcholine or histamine; both of these substances have been recovered after stimulation of posterior root fibers.[23] What one can state with assurance is that in the causalgic state, unlike in other painful states which lead to continuous afferent impulses, there is an efferent stimulation of pain-producing, vasodilator substances which unless blocked or neutralized early will lead to the sensitization of higher and higher levels. It has also been previously [24] pointed out that neostigmine, a cholinergic vasodilator, is capable of producing a type of vasodilatation exhibited by causalgia (fig. 5).

In this group of 54 cases there was no evidence that any definite type of personality was responsible for this unusual reaction to a sensory stimulus. But the study of the fundamental work of Bayliss [4] reveals that under certain conditions, such as weak stimuli, cooling of the nerve or regeneration of a partially injured nerve, the stimulation of a peripheral nerve results in vasodilatation with a simultaneous inhibition of the vasoconstrictors. He also showed that stimuli which usually produce pressor effects may have a reversal of their effect to vasodilatation under the influence of drugs which affect a higher level. Thus cocaine, which usually produces a vasoconstriction and a rise in pressure, will produce vasodilatation when preceded by strychnine.

Fig. 4.—Oscillometric curves in the case of F. G., a man aged 55, a railroad employee, who suffered a fracture of the right fibula with an ankle sprain. The fracture was not recognized immediately and he walked on this foot for some time. Six months after the injury there was an area of anhidrosis with hyperesthesia corresponding to the distribution of the superficial peroneal nerve. The oscillometric curve showed much increased pulse waves between 150 and 80 mm. of mercury, as compared to the normal side. There is a typical diminution of the waves at 75 mm. of mercury, which is quite sudden. The pain was throbbing, vascular, the foot was edematous and glossy. Cold, moist towels gave temporary relief. Twenty minutes after a paravertebral sympathetic block there is an obvious increase in circulation. However, while the large spike at 125 mm. of mercury, seen before the block, is now absent, the maximal pulsations have shifted toward the right, toward lower pressures, reaching their maximum between 85 and 70 mm. of mercury. The decrease toward lower pressures is gradual. Pain completely disappeared for forty-eight hours. After a few blocks pain was completely abolished and weight bearing resumed. This is the typical vascular reaction of a causalgic state (first stage) to a sympathetic block.

These findings have an immediate bearing on the problem at hand. They indicate that the causalgic state, as in the experimental animal, is a state of reversal from a normal vasomotor reaction and that this reversal is brought about by a changed state either of the peripheral nerve or of the higher centers. The character of the injury, namely pressure, traction or contusion, may be responsible for this peculiar phenomenon.

SUMMARY

The causalgic state is due to a chronic irritation of sensory pathways producing cutaneous hyperalgesia, burning pain and a local increase in blood flow. Three

20. de Takats, G.: Reflex Dystrophy of the Extremities, Arch. Surg. **34**: 939 (May) 1937.
21. Riddoch, G.: Phantom Limb and Body Shape, Brain **64**: 197, 1941.
22. Toennies, J. F.: Reflex Discharge from the Spinal Cord over Dorsal Roots, J. Neurophysiol. **1**: 378, 1938. Lewis, T.: Observations on the Vascular Axon Reflex in Human Skin as Exhibited by a Case of Urticaria with Remarks on the Nocifensor Nerve Hypothesis, Clin. Sc. **4**: 365, 1942.
23. Cannon, W. B., and Rosenblueth, A.: Autonomic Neuroeffector Systems, New York, Macmillan Company, 1937. Kwiatkowski, M.: Histamine in Nervous Tissue, J. Physiol. **102**: 32, 1943.
24. de Takats, G.: Nature of Painful Vasodilatation in Causalgic States, Arch. Neurol. & Psychiat. **50**: 318 (Sept.) 1943.

sensory levels, a peripheral, a spinal and a cortical, can be clinically recognized. The lesion becomes more and more intractable the higher it ascends. In the first stage local infiltration and block of the paravertebral sympathetic nerves are effective. At the second level anterolateral chordotomy has been most helpful. The treatment of the third stage with cerebral tractotomies or removal of the sensory cortex is still in its infancy. Early diagnosis and immediate treatment saves much suffering and eliminates permanent disability. The true hysterical lesion shows no vasomotor changes except those due to immobility.

ILLUSTRATIVE CASE HISTORIES

LESIONS OF THE FIRST NEURON

CASE 1.—F. G., a man aged 56, a conductor, injured his right leg on Dec. 21, 1942. At first an ankle sprain was diagnosed, but after a few days a fracture of the upper third of the fibula was identified by x-ray. A cast was applied but had to be removed in four days because of severe burning pain and edema. Neither moist nor dry heat relieved the pain. Ice packs gave some help. Deep phlebitis was suspected because of the edema. He was unable to bear weight on this leg because of severe pain and had been hospitalized for several months at a time. Examination July 3, 1943, seven months after the injury, revealed an erythematous, swollen right lower leg. He had good evidence of a deep venous thrombosis, but the oscillograms (fig. 4) and the pronounced osteoporosis suggested a causalgic state. The skin was warm and dry along the distribution of the superficial peroneal nerve, cold, moist and clammy around this area, a marginal hyperhidrosis. Following repeated lumbar sympathetic blocks he was able to get up and walk around bearing weight on the right leg, which he had been unable to do for seven months. He was discharged on July 31, 1943 with an elastic hose, with ability to walk around without crutches. The skin temperature remained increased for a year after the injury. He returned to limited duty but was found to suffer from an inoperable carcinoma of the stomach in the middle of May 1944.

Because of the fracture and the consecutive deep venous thrombosis the injury to the superficial peroneal nerve was missed by many observers. The patient was regarded as a malingerer, which made him defiant and ready to file suit. A simple clinical examination and repeated lumbar sympathetic blocks restored his earning power.

CASE 2.—M. P., a woman aged 25, admitted Jan. 26, 1943 and discharged Feb. 6, 1943, developed blisters on the fingers of the right hand while stripping cables, three months before admission. Her right hand became infected, and red streaks spread up from the wrist to the axilla. She was treated with hot fomentations and sulfadiazine at another hospital, and the acute infection subsided. However, a burning type of pain persisted which was aggravated by heat and dependency, alleviated by moist cold and elevation. Oscillometric curves showed increased peripheral resistance on the right side, right 5/100, left 5/80. Following block of the stellate ganglion the right arm and hand became dry and a complete Horner's syndrome developed. The oscillations increased but the pain and stiffness were relieved. There was no osteoporosis. She was given x-ray therapy to the right axilla: 125 kilovolt peak, 20 milliamperes, 50 cm. focal distance, ¼ copper 1 aluminum filter, 105 roentgens. She was readmitted a month later with a multiplicity of symptoms. She cried easily and had fainting spells. Dr. Francis Gerty found a suggestible, psychoneurotic background. She was quite anemic. Following some occupational therapy the pain and vasomotor symptoms in the arm were fully relieved. She has been said to have started suit against her employer.

Here is a psychoneurotic individual in whom an attack of acute lymphangitis acted like a trigger to bring out a variety of symptoms. There was, however, objective evidence of nerve irritation. A perineural lymphangitis may well produce a causalgic state, as in the case of a radial nerve injury of Weir Mitchell's in which the causalgia started after the wound became infected and erysipelas set in.[1]

CASE 3.—P. T., a man aged 42, admitted on Dec. 27, 1943, complained of anxiety regarding his health, "excessive warmth" of the left arm and pain under the inferior angle of the left scapula and the inner aspect of the left arm as far as the elbow. The pain was relieved by elevation. Night sweats and dizziness also were present. An electrocardiogram and chest films were said to be negative. The left arm and hand were noticeably warm and dry but not flushed. There was a Horner's syndrome on the left. Oscillations greatly increased but showed

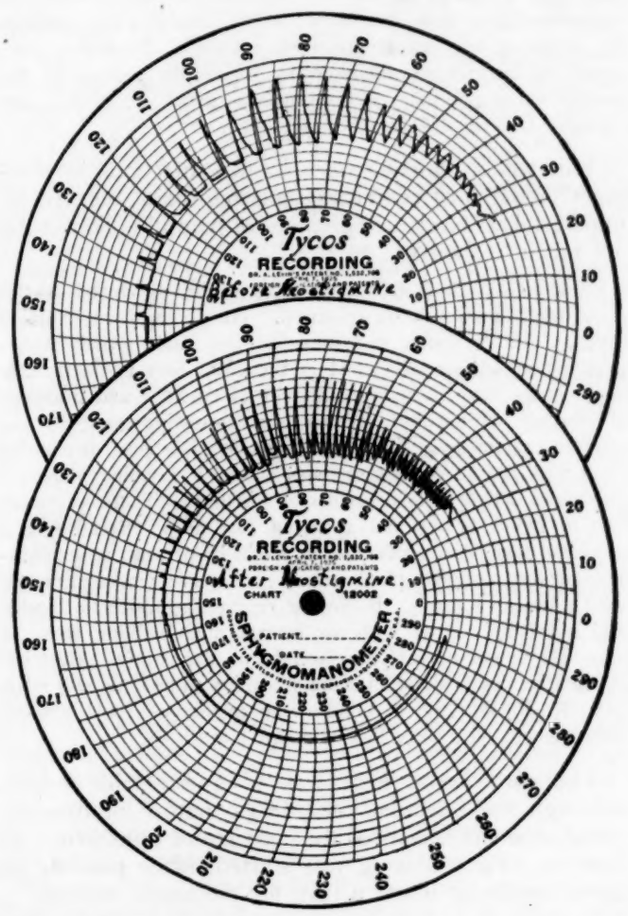

Fig. 5.—This patient, with a normal cardiovascular status, received 1 mg. of neostigmine subcutaneously together with 0.5 mg. of atropine sulfate to counteract the side effects. It is known that atropine will not affect the cholinergic vasodilatation produced by neostigmine. Note that one-half hour after the injection of neostigmine there is a striking rise of peripheral resistance at 60 mm. of mercury. The rise in pulse waves occurs between 90 and 60 mm. of mercury. This is the type of vasodilatation seen in causalgic states, which differs greatly from that following sympathetic paralysis or the administration of sodium nitrite.

increased peripheral resistance. Motor and sensory nerves were intact. X-ray examination revealed a tumor of the left apex.

On Jan. 19, 1944 left upper lobectomy was performed by Dr. W. Van Hazel. The tumor was seen to invade the first and second intervertebral foramens. A small portion of the tumor could not be removed. Intensive x-ray therapy was given shortly after the operation.

The severe causalgic pain continued after the operation. He rapidly went down-hill and died in April 1944. His first and

dominant symptom was the causalgic type of pain of the left arm due to irritation of the posterior roots and ganglions at the intervertebral foramens.

LESIONS OF THE SECOND NEURON

CASE 4.—J. K., a woman aged 39, admitted Nov. 23, 1941, had had severe poliomyelitis in South America in 1936 affecting the right arm, right jaw and left leg. Slight motor weakness remained but also a nagging, throbbing pain, relieved by elevation and cold, exaggerated by heat. There was also muscle twitching in the left leg, mostly at night.

The left leg was slightly atrophic, with partial foot drop. It was colder at room temperature, hotter and swollen in warm weather. The oscillometric readings were increased on the affected side. There was a diffuse hyperalgesia and a constricting type of pain around the thigh, which increased on fatigue. There was a weakness of the internal hamstrings. The faradic current gave a moderate feeling of warmth on the right and a sharp, lancinating pain on the left. Since the histamine flares were diminished, it was thought that perhaps the posterior root ganglions were involved. Treatment consisted of intravenous thiamine hydrochloride, x-rays to the paravertebral ganglions and sympathetic block. She was discharged Dec. 3, 1941 greatly improved.

This was a patient with a known infectious involvement of the cord producing causalgic pain, relieved by paravertebral block. Such cases of painful poliomyelitis are not infrequent.

CASE 5.—L. C., a man aged 22, a sailor, developed scarlet fever after a submucous resection. He received sulfonamide drugs. An erythema nodosum followed and, shortly after, pain and numbness developed in the right foot and left arm. Six months later there were attacks of coldness and cyanosis, alternating with rubor, edema and throbbing pain in the affected extremities. There was pronounced osteoporosis in the right foot and an oscillogram was obtained revealing increased pulsations with increased peripheral resistance. There was some loss of motor power and a partial foot drop. Because of a suspicion that periarteritis nodosa might be present, an exploration of the posterior tibial vessels and nerve was undertaken with a negative result. Following repeated sympathetic blocks, and aided by a cast with an incorporated walking iron, he was able to get up and bear weight on the painful extremity. A tentative diagnosis of an acute disseminated myelitis was made (Dr. R. P. Mackay). A follow-up inquiry revealed gradual improvement with some loss of motor power.

The cord lesion here was of questionable origin, although the infectious or allergic nature of disseminated vascular lesions of the cord is not unknown. As soon as weight bearing was started, made possible by the sympathetic block, a turn for the better ensued.

LESIONS OF THE THIRD NEURON

CASE 6.—A. F., a man aged 75, a retired executive, suffered an attack of cerebral thrombosis in May 1939. A left hemiplegia developed with a gradual return of motor power. However, the paralyzed left limb became agonizingly painful, with intermittent exacerbations of lancinating pain. During such attacks the oscillations increased and the skin temperature rose. Nothing was found to relieve the pain effectively. Between attacks a pronounced dysesthesia was present. He died three years after the initial vascular accident.

This pain was certainly central, whether thalamic due to cortical release or cortical due to an irritative lesion is uncertain. The attacks of vasodilatation accompanying these sensory jacksonian fits place this pain among the causalgic states.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. WARREN H. COLE, Chicago: Insufficient time has elapsed since our entry into the war for us to obtain accurate data from war casualties on the incidence of this condition. A German report of 2 cases of causalgia in 500 cases of nerve injury (Reichert: *Bull. War Med.* **3**:379, 1942) probably represents an average incidence. However, it must be emphasized that the etiologic factors are extremely numerous, many cases developing when the role of nerve injury would appear insignificant. The most impressive case which has come to my attention developed two or three weeks following a relatively mild ankle sprain in a person with no neurotic or hysterical tendencies. Although it may be difficult on many occasions to differentiate this condition from malingering states, the presence of a warm, shiny and pink skin along with increased blood flow should readily make the differentiation. The warm and pink surface may change to a cool and cyanotic skin. Unfortunately, treatment is by no means satisfactory. Early in the disease the patient learns that keeping the affected limb elevated, cool and moist adds to comfort. Even though this simple therapy may be quite effective, it cannot be adopted as the sole and permanent therapy because of the serious dangers of mental deterioration developing as the disease progresses. I know of no definite evidence that these mental changes predispose to the disease; it appears much more logical to me that the extreme pain and disability suffered week after week and month after month would be the primary factor in development of the mental deterioration. The possibility of development of serious mental changes more than justifies the philosophy that therapy must be carried out with minimal delay even though it may appear quite radical. Sympathetic block (including sympathectomy) appears to be accepted quite generally as offering the best chance of obtaining relief. At times, frequent blocks with procaine will result in permanent relief. Dr. de Takats correctly emphasized the fact that sympathectomy should not be performed if procaine block is ineffective in relieving pain. Neurolysis has been reported frequently as being effective and should be considered particularly when there appears a strong probability that the nerve was crushed or otherwise damaged.

EFFECTIVENESS OF PENICILLIN IN THE TREATMENT OF VINCENT'S ANGINA

CAPTAIN BERNARD M. SCHWARTZ
MEDICAL CORPS, ARMY OF THE UNITED STATES

The effectiveness of penicillin as an antispirochetal agent in the treatment of syphilis,[1] relapsing fever,[2] Weil's disease [3] and rat bite fever [4] has prompted a study of its use in Vincent's infections.

For this study, only patients with Vincent's angina have been selected because Vincent's infection of the tonsil, although subject to recurrence, is an acute illness and is almost always a primary infection. Where it is not, the underlying cause, such as a blood dyscrasia, is evident. On the other hand, Vincent's gingivitis is much more apt to be a chronic or frequently recurrent illness, often associated with dental abnormalities or faulty

From A. A. F. Regional Hospital, Truax Field, Madison 7, Wis.

1. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis: A Preliminary Report, Ven. Dis. Inform. **24**: 355-356 (Dec.) 1943; Am. J. Pub. Health **33**: 1387 (Dec.) 1943.
2. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Relapsing Fever, Proc. Staff Meet., Mayo Clin. **18**: 457-467 (Dec. 1) 1943. Augustine, D. L.; Weinman, D., and McAllister, Joan: Rapid and Sterilizing Effect of Penicillin Sodium in Experimental Relapsing Fever Infections and Its Ineffectiveness in the Treatment of Trypanosomiasis (Trypanosoma Lewisi) and Toxoplasmosis, Science **99**: 19-20 (Jan. 7) 1944. Lourie and Collier.[4]
3. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Leptospirosis Icterohemorrhagica (Weil's Disease), Proc. Staff Meet., Mayo Clin. **19**: 89-99 (Feb. 23) 1944.
4. Lourie, E. M., and Collier, H. O. J.: The Therapeutic Action of Penicillin on Spirocheta Recurrentis and Spirillum Minus in Mice, Ann. Trop. Med. **37**: 200-205 (Dec. 31) 1943. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Infections with Spirillum Minus and Streptobacillus Moniliformis (Rat Bite Fever), Proc. Staff Meet., Mayo Clin. **19**: 257-264 (May 17) 1944.

nutrition, and its treatment entails proper dental or vitamin therapy as well as antispirochetal measures. True evaluation of chemotherapy for Vincent's gingivitis, therefore, is difficult and a long follow-up period is necessary.

Fourteen cases of Vincent's angina have been treated with penicillin at this hospital, as summarized in the table. Diagnosis was established by positive clinical and laboratory findings. Clinically the local lesions on the tonsil or pharynx had the following features in varying severity and combination: hyperemia, ulceration, exudation (pseudomembrane), bleeding, characteristic odor, submaxillary lymphadenopathy, edema and associated mild gingivitis. One patient had a temperature of 101.2 F. (oral). The others either had slight fever (99-100 F.) or were afebrile. Symptoms in every case were pronounced. Pain in severe cases was so intense that solid food was refused. In some instances the symptoms were out of proportion to the physical findings.

In each case a dried smear of exudate from the lesion was positive for Borrelia vincenti. No smear was considered positive unless there was an unequivocal profusion of characteristic spirochetes and fusiform organisms present. In addition, in several cases, throat culture was negative for other pathogenic organisms. The differential leukocyte counts revealed no abnormal cells.

Penicillin was injected intramuscularly in each case. The intramuscular route was chosen in preference to local application for several reasons. Studies of the effect of penicillin on other micro-organisms have shown that it exerts its maximum effect after six to eight hours of contact.[5] Without knowing the length of time locally applied penicillin remains in contact with mucous membranes, one would find it hard to advise rational dosage schedules. The ease with which locally applied penicillin will penetrate to the depths of an exudate covered ulcer is unknown. Furthermore, it has been shown that parenterally injected penicillin is secreted in the saliva.[6] Thus, when the intramuscular route is employed the deep portions of the local lesion will be constantly attacked by penicillin conveyed in the blood stream while the superficial portions will be continually bathed by the penicillin present in the saliva.

The first 2 patients to be treated were given a total of 200,000 units of the sodium salt of penicillin administered in 20,000 unit doses every three hours intramuscularly. The response was so satisfactory that all subsequent cases, with 3 exceptions, had the dosage reduced to 100,000 units administered in 20,000 unit doses every three hours. The 3 exceptions were as follows: In 1 moderately severe case two doses of 50,000 units were given six hours apart, and in 2 mild cases a total of 50,000 and 25,000 units was given in one dose, respectively. Although the response in these 3 cases was satisfactory, it was deemed advisable to continue this study with doses of 100,000 units (20,000 units every three hours) because the smaller doses given were found to be only temporarily effective in cases of Vincent's gingivitis being observed at about the same time.

The result in each case treated was satisfactory. In every instance subjective discomfort was decidedly alleviated in twenty-four hours and completely eliminated in forty-eight hours. There was definite improvement within four to six hours. In every instance the smear which was positive before treatment became negative after treatment. Ten of 11 patients who had smears taken within twenty-four hours after the onset of treatment had negative smears at this time. The eleventh patient, who had received only 25,000 units, had a positive smear remaining after twenty-four hours but, without further penicillin or other therapy, had negative smears in forty-eight, seventy-two and ninety-six hours. The remaining 3 patients, whose clinical response was in every way similar to the foregoing 11, had negative smears two, three and nine days after treatment, respectively.

The appearance of the lesions also improved remarkably, although this improvement was not as dramatic as the relief of subjective symptoms and the disappearance of the organisms from the smears. The first effect, noted within twenty-four hours, was a change in the color and character of the exudate. The usual change was from a dirty gray or yellow membrane which bled easily to a clean whitish gray film which did not bleed. The offensive odor disappeared in twenty-four hours. The exudate and ulcer required from one to ten days for complete disappearance, depending on the initial severity of the lesion. Simultaneously, adenopathy gradually subsided. When present originally, gingivitis rapidly disappeared. The temperature was invariably normal after twenty-four hours. No recurrences have been observed.

Course in Fourteen Cases of Vincent's Angina Treated with Penicillin

Case	Severity	Tonsil Affected	Previous Treatment	Smear Before Penicillin, After Previous Therapy	Penicillin: Total Dosage, Units	Penicillin: Treatment Period, Hours	Smear from Beginning of Penicillin: 24 Hrs.	48 Hrs.	72 Hrs.	96 Hrs.	Days for Exudate to Disappear
1	Severe	Bilateral	Hydrogen peroxide	+	200,000	12, +12 †	—	—	..	..	4
2	Moderate *	Right	Sodium perborate, hydrogen peroxide	+	200,000	27	—	..	..	..	1
3	Severe	Bilateral	.....	+	100,000	12	—	—	—	..	10
4	Moderate	Bilateral	.....	+	100,000	12	..	—	—	—	2
5	Moderate *	Left	.....	+	100,000	12	—	..	..	..	2+
6	Moderate	Right	Sulfadiazine	+	100,000	6	—	—	..	..	2+
7	Mild	Right	.....	+(2)‡	25,000	—	+	—	—	—	5+
8	Severe	Right	.....	+	100,000	12	—	—	..	..	3+
9	Mild	Bilateral	.....	+	50,000	—	—	..	..	..	1
10	Moderate	Right	Hydrogen peroxide	+(2)‡	100,000	12	—	..	..	..	2
11	Moderate *	Right	Hydrogen peroxide	+	100,000	12	—	..	..	..	2
12	Moderate	Left	Hydrogen peroxide, sulfadiazine	+(2)‡	100,000	12	..	..	—	..	3
13	Severe	Left	Sodium perborate	+	100,000	12	..	..	..	§	6
14	Moderate	Right	.....	+	100,000	12	—	—	—	..	3+

* Associated mild gingivitis. † Two separate courses on two successive days. ‡ Positive smears on two successive days.
§ Smear negative after nine days.

5. Keefer, C. S.; Blake, F. G.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections: A Report of 500 Cases, J. A. M. A. **122**: 1217-1224 (Aug. 28) 1943.
6. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Further Observations on Penicillin, Lancet **2**: 177-188 (Aug. 16) 1941.

The results demonstrate that penicillin is an effective agent in the treatment of Vincent's angina. From my own experience it is definitely superior to hydrogen peroxide or sodium perborate gargles. Several of the patients had received these medications before penicillin was started with slight or no improvement and continued positive smears after twenty-four to forty-eight hours. The rapidity with which penicillin acts should be of value in reducing the loss of man hours in military and civilian life, in decreasing contagiousness and in reducing the period of discomfort for the patient.

Schuessler, Fairchild and Stransky [7] and Strock [8] have found penicillin in the form of spray or mouth wash to be effective in the treatment of Vincent's stomatitis. Barr,[9] in a summary of results of penicillin therapy in the Navy, records 4 cases of Vincent's infection successfully treated, without further details. Denny, Shallenberger and Pyle [10] have also found penicillin effective for Vincent's infections. It should be pointed out that when Denny and his associates applied penicillin solutions in a concentration of 250 units per cubic centimeter to tonsillar lesions the smears became negative in three days, but in the 1 case in which they gave penicillin intramuscularly smears were negative within twenty-four hours. It would seem, from my experience, that the total dosage of 520,000 units given in this case was greater than is necessary. In a recent case of severe fusospirochetal balanitis treated by Capt. W. F. Schwartz,[11] at this station, 200,000 units of penicillin in a period of forty-eight hours resulted in a dramatic cure. The patient had subjective relief in four hours, and the inflammation had subsided about 80 per cent in twenty-four hours.[12]

SUMMARY AND CONCLUSIONS

1. Penicillin has been found to be of definite value in the treatment of Vincent's angina in 14 cases.

2. The recommended dose is 100,000 units administered intramuscularly in 20,000 unit doses every three hours. In mild cases smaller doses may be required and in unusually severe cases larger doses may be required.

7. Schuessler, C. F.; Fairchild, J. M., and Stransky, I.: Penicillin in the Treatment of Vincent's Infection, J. A. D. A. **32**: 551-554 (May) 1945.

8. Strock, A. E.: Relationship Between Gingivitis and Penicillin Administration, J. A. D. A. **31**: 1235-1236 (Sept.) 1944.

9. Barr, J. S.: The Use of Penicillin in the Navy, J. Bone & Joint Surg. **26**: 380-386 (April) 1944.

10. Denny, E. R.; Shallenberger, P. L., and Pyle, H. D.: Clinical Observations in Use of Penicillin, J. Oklahoma M. A. **37**: 193-205 (May) 1944.

11. Schwartz, W. F.: Personal communication to the author.

12. Since the submission of this article for approval for publication, the total number of cases treated has risen to 41, with similar results. Among these have been 3 cases of infectious mononucleosis with secondary Vincent's tonsillitis and gingivitis. Penicillin has had no effect on the course of the infectious mononucleosis but has eliminated the Vincent's infection.

Natural Control of the Black Widow Spider.—Enemies of the black widow spider should be encouraged to propagate and multiply. Those parasitic insects which pray on Latrodectus mactans should be permitted to roam unhampered in their outdoor habitats, and increasing efforts must be made to evaluate their spider-destroying propensities. The mud-dauber's nest, heretofore considered only as an evidence of untidiness, may now be accepted as indicative of human enlightenment, the abode of a known destroyer of the world's most poisonous arachnid. An appalling record of human suffering has been double-checked back to Latrodectus mactans and her prototypes. There is no appeal from the indictment, and mankind must now make a unified effort toward curtailment of the greatest arachnid menace the world has ever known.—Thorp, Raymond W., and Woodson, Weldon D.: Black Widow—America's Most Poisonous Spider, Chapel Hill, University of North Carolina Press, 1945.

THE USE OF PENICILLIN IN VINCENT'S ANGINA

MAJOR PAUL L. SHALLENBERGER
LIEUTENANT COLONEL EARL R. DENNY
AND
MAJOR HAROLD D. PYLE
MEDICAL CORPS, ARMY OF THE UNITED STATES

The chemotherapeutic effects of penicillin in certain spirochetal infections have been successfully demonstrated in human subjects and in experimental animals.

Mahoney [1] was the first to demonstrate the spirocheticidal effect of penicillin. In a careful and well planned study, he observed the disappearance of Treponema pallidum from scrapings of chancres after fourteen hours of treatment using 25,000 units intramuscularly at four hour intervals. Furthermore, the duration of the primary ulcerations was only eight days. We confirmed these observations by using penicillin in doses of 25,000 units every three hours on 2 patients with primary chancres. The dark field examinations were positive through the eighth hour following the institution of treatment, but specimens obtained at twelve hours did not contain Treponema pallidum. O'Leary and Herrell [2] observed a rapid disappearance of the late cutaneous manifestations of syphilis, following continuous intravenous drip of 20,000 units of penicillin twice daily.

Penicillin is highly effective against other types of spirochetes, as clearly shown in experimentally produced Leptospira icterohemorrhagiae infection in guinea pigs. In February 1944 Heilman and Herrell [3] reported their investigations with penicillin in experimental Weil's disease. In 64 guinea pigs infected with Leptospira icterohemorrhagiae 32 were treated intramuscularly daily for seven days with 800 units of calcium penicillin suspended in sesame oil. Of these 32 guinea pigs none died of the disease, although 3 died from toxic effects attributed to penicillin. Twenty-nine of the 32 untreated control animals died of Weil's disease.

Penicillin is not, however, equally effective against all strains of Leptospira icterohemorrhagiae. Augustine and his associates,[4] using a virulent strain, found that penicillin did not cure the disease in guinea pigs if treatment was started after the appearance of the symptoms. That pencillin may exert some suppressive effect is suggested by survival of some inoculated animals if treatment was started prior to the appearance of signs of the disease.

In view of the spirocheticidal potentiality of penicillin, one of us (P. L. S.) suggested that penicillin might be of value in the treatment of infections due to or associated with Vincent's organisms. In a previous report [5] our clinical and bacteriologic observations indicated that penicillin was indeed highly effective in the treatment of Vincent's infection.

Mr. J. W. Crunelle, head of the photographic department, University of Chicago, made the photomicrographs. T/5 Edmond R. Marzec and Miss Catherine J. Vanderboom, Gardiner General Hospital, made the major portion of the bacteriologic examinations.

1. Mahoney, J. F.; Arnold, R. E., and Harris, A. D.: Penicillin Treatment of Early Syphilis: A Preliminary Report, Am. J. Pub. Health **33**: 1387 (Dec.) 1943.

2. O'Leary, P. A., and Herrell, W. E.: Penicillin in the Treatment of Late Cutaneous Syphilis: Report of a Case, Proc. Staff Meet., Mayo Clin. **19**: 20 (Jan. 12) 1944.

3. Heilman, F. R., and Herrell, W. E.: Penicillin in the Treatment of Experimental Leptospirosis Icterohaemorrhagica (Weil's Disease), Proc. Staff Meet., Mayo Clin. **19**: 89 (Feb. 23) 1944.

4. Augustine, D. L.; Weinman, D., and McAllister, J.: Penicillin Sodium Therapy in Experimental Weil's Disease, New England J. Med. **231**: 358 (Sept. 7) 1944.

5. Denny, E. R.; Shallenberger, P. L., and Pyle, H. D.: Clinical Observations in the Use of Penicillin, J. Oklahoma M. A. **37**: 193 (May) 1944.

METHOD OF STUDY

The present study is based on adult patients suffering from Vincent's infections admitted to the communicable disease section of the Gardiner General Hospital.

The diagnosis of Vincent's angina was established in each patient by the findings of a patch or patches of pseudomembrane which is formed by the necrosis of the superficial layers of the mucous membrane and not by exudation. The patches were grayish white surrounded by an inflamed areola, usually separated from one another by normal healthy tissue. When the pseudomembrane, which was granular and cheesy in consistency, was removed an underlying ulcerative area was found with some variation in extent and depth. There was a tendency for the ulcerated area to bleed and the reformation of a new pseudomembrane. The areas involved were often confined to one or both of the tonsils, the tonsillar fossae if the tonsils had been removed, the pharynx or the soft palate. The clinical diagnosis was confirmed by making a microscopic examination of a fresh smear taken directly from the ulcer or the scrapings from the pseudomembrane, stained with warm carbolized crystal violet, demonstrating fusiform bacilli which were twice as long as they were wide, pointed at the ends, and a spirillum approximately 10 to 20 microns in length. From each patient of groups 3 and 4 cultures were obtained to exclude other pathogens, such as hemolytic streptococci.

The patients were divided into four groups. Group 1 consisted of 13 patients admitted during November and December 1943 who were treated variously with hydrogen peroxide, sodium perborate, chromic acid, silver nitrate and oxophenarsine hydrochloride (mapharsen). Most of this group were treated by swabbing the involved areas three times daily with a mixture of 3 per cent chromic acid and 10 per cent silver nitrate, preceded by gargling a mixture of equal parts of 50 per cent sodium perborate and 50 per cent hydrogen peroxide. A few of the patients received, in addition to this treatment, and others alone, 0.03 Gm. of oxophenarsine hydrochloride intravenously every second or third day.

Group 2 consisted of 11 patients admitted during January and February 1944 who were treated with 1 Gm. doses of sulfadiazine, used as lozenges, every four hours.

Group 3 consisted of 9 patients admitted subsequent to February 1944 and treated with penicillin by local application. The following method was used: 1. The involved tissues were swabbed with penicillin in a concentration of from 250 to 500 units per cubic centimeter four times daily. 2. Daily smears were obtained. 3. Treatment was continued until the smears were negative for Vincent's organisms.

No other supportive treatment was administered, although acetylsalicylic acid 5 grains (0.32 Gm.) was given as indicated for the relief of pain.

As the investigation progressed, concentrations of the penicillin solution used were maintained at 500 units per cubic centimeter.

Group 4 consisted of 2 patients treated with penicillin administered intramuscularly alone. One of those was treated with penicillin intramuscularly because his symptoms were unusually severe. In order to determine the clinical and bacteriologic effectiveness of penicillin following intramuscular administration, the second patient of this group was subjected to detailed study. The procedure in investigating this patient was as follows: (1) Culture and (2) warm carbolized crystal violet stained smears of the lesions were made on admission; (3) 15,000 units of penicillin in a concentration of 10,000 units per cubic centimeter was administered intramuscularly every three hours for eight doses; (4) following the institution of penicillin treatment estimates of the number of Vincent's organisms on stained smears were made hourly for twelve hours and subsequently at less frequent intervals, as indicated in figure 2; (5) the changes in objective and subjective symptoms were observed at the time specimens were obtained for bacteriologic examinations.

THERAPEUTIC RESULTS IN CONTROL GROUPS

Prior to January 1944 it was common practice to apply directly to the affected areas astringent agents and other medicinals which liberated nascent oxygen. As already noted we used mixtures of chromic acid and silver nitrate, sodium perborate and hydrogen peroxide, and in some cases oxophenarsine hydrochloride with this treatment, and in others alone. The summary of these cases is presented in figure 1. It is to be noted that in this group most of the smears did not become negative until the seventh to the twelfth day.

During January and February 1944 we began using 1 Gm. doses of sulfadiazine every four hours administered as lozenges. There were 11 cases treated by this method. In most of the cases the smears became negative for Vincent's organisms by the seventh or ninth day.

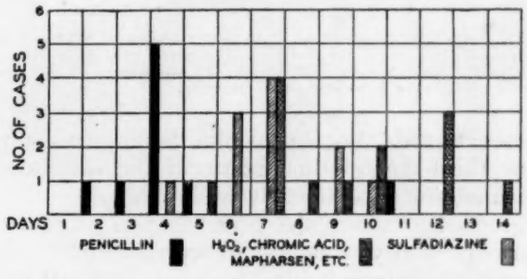

Fig. 1.—Comparative therapeutic effect in Vincent's infection of (1) hydrogen peroxide, chromic acid, oxophenarsine hydrochloride and so on and (3) penicillin. The ordinate indicates the number of cases. The abscissa indicates the days on which smears became negative for Vincent's organisms.

THERAPEUTIC RESULTS WITH LOCAL APPLICATIONS OF PENICILLIN

In group 3 the clinical and bacteriologic responses as obtained with local penicillin therapy were very striking. There was improvement in the appearance of the ulcerations in twenty-four to forty-eight hours and a relatively rapid subsidence of the symptoms. Pain was rapidly relieved in those patients who were suffering severely. The grayish membrane would often start receding in from three to five days from the beginning of treatment. The organisms disappeared frequently before the pseudomembrane faded. The rate at which the organisms disappeared from the infected site is indicated in figure 1. With the exception of 1 case, the infecting organisms disappeared from the site of infection by the fifth day. Excluding this 1 case, which persisted in giving a positive smear, although clinically much improved by the fourth day, the average time of disappearance of Vincent's organisms was 3.7 days following the institution of penicillin therapy.

A soldier was admitted with huge swollen red tonsils, pharyngeal injection, painful throat and fever. The cultures of the tonsils showed beta hemolytic strepto-

cocci, and smears revealed large numbers of fusiform bacilli and spirochetes. He was given sulfadiazine lozenges and on the second hospital day he developed a grayish white membrane over both tonsils. He continued to complain of painful throat. During the succeeding two days the cultures became negative for hemolytic streptococci but the smear remained positive for Vincent's organisms in large numbers. Sulfadiazine

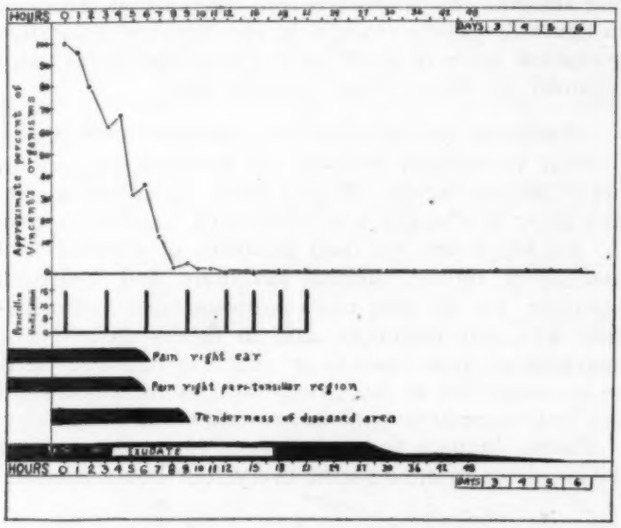

Fig. 2.—Approximate percentage in Vincent's angina of Vincent's organisms, penicillin dosage and the duration of referred pain to the right ear, the pain in the right peritonsillar region, the tenderness of the diseased area and exudate over the ulcer chronologically.

was discontinued. Local penicillin therapy was started. On the third day of this treatment the smears were negative and he was clinically well.

In group 4 intramuscular penicillin was administered to 1 patient who was acutely ill with Vincent's angina because of the severity of the disease. This patient had a temperature of 103.8 F. with hot, moist, flushed skin, a pulse rate of 110 and pronounced injection of all the gum margins, the tonsils and the pharyngeal wall. There was considerable edema with an occasional patch of loosely attached grayish membrane, over the tonsils and pharyngeal wall, which bled on separation. The submaxillary lymph nodes were enlarged and painful. The pain was severe. He was given 25,000 units intramuscularly followed with 15,000 units intramuscularly every three hours for thirty-three doses. An alpha hemolytic streptococcus was obtained on culture, but the predominating organisms were fusiform bacilli and spirilla of Vincent's organisms. Spirilla and fusiform bacilli persisted on the second day of treatment, but on the third day of treatment repeated smears showed no evidence of the organisms. There was definite clinical improvement within forty-eight hours.

The second patient in group 4 who was studied in considerable detail was a soldier aged 23 who five and two days prior to entry developed pain in the right peritonsillar area and pain in the right ear respectively. These symptoms became progressively more severe. Moderate fatigue developed two days prior to entry. On admission the significant findings were as follows: The tonsils had been removed. An ulcer, approximately 1 by 2 cm. covered by a grayish white membrane surrounded by edematous hyperemic mucosa, was present in the right tonsillar fossa. There was moderate hyperplasia and redness of lymphoid tissue on the posterior pharyngeal wall. The buccal and gingival mucosa appeared normal. The right submaxillary gland was slightly enlarged and tender. The findings on otoscopy were normal, indicating that the pain in the right ear was referred from the diseased right tonsillar area. The complete blood count was normal. Culture of the lesion showed only a few hemolytic streptococci, Lancefield type C, but direct smear revealed innumerable fusiform bacilli and spirilla. The therapy and subsequent bacteriologic studies described are recorded in figure 2. By the sixth hour after the first dose of penicillin, pain in the right peritonsillar area and the right ear ceased and tenderness in the right peritonsillar region stopped two hours later. There was less edema about the lesion twenty-four hours after the start of treatment. At forty-eight and seventy-two hours the size of the ulcer and pseudomembrane had diminished progressively. The latter gradually faded and disappeared on the ninth day.

In estimating the rapidity with which the Vincent's organisms disappeared following treatment, the smear taken prior to the institution of treatment was presumed to represent 100 per cent. The injection of 15,000 units of penicillin resulted in a reduction of approximately 40 per cent of the organisms in three hours; following a second 15,000 unit treatment an additional 25 per cent reduction of organisms resulted three hours later; two hours after the third treatment, or eight hours after the first treatment with penicillin, fusiform bacilli and spirilla could be found only by searching several fields on the slide. Twelve hours after starting treatment, or after the patient had received 60,000 units, fusiform bacilli and spirilla completely disappeared from

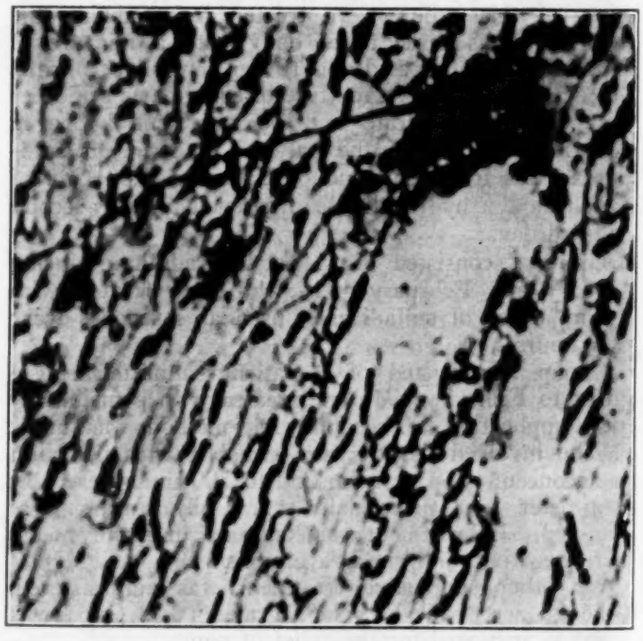

Fig. 3.—Organisms present immediately before the first injection of penicillin.

the site of infection, and subsequent examinations during the next five days resulted in negative findings as indicated in figure 2.

CYTOLOGIC FINDINGS

The photomicrographs taken immediately before the first injection of penicillin (fig. 3), the one taken three hours later (fig. 4) and seven hours later (fig. 5) clearly demonstrate the rapid disappearance of the

organisms. Only 7 fusiform bacilli and 1 spirillum are seen in the smear taken seven hours after the institution of treatment.

COMPARATIVE THERAPEUTIC RESULTS

The comparative therapeutic results as obtained with sodium perborate and hydrogen peroxide, chromic acid and silver nitrate, and oxophenarsine hydrochloride

Fig. 4.—Appearance three hours later.

(group 1), with sulfadiazine as lozenges (group 2) and with local penicillin (group 3) are shown in figure 1.

In group 1, consisting of 13 patients, there were none in whom the smear became negative before the fifth day, and in 3 patients the smear did not become negative until the twelfth day and 1 was not bacteriologically free until the fourteenth day of treatment. The average time before the smear became negative was 8.8 days.

Eleven patients (group 2) were treated with sulfadiazine lozenges. The smears of 1 patient became negative for Vincent's organisms on the fourth day, and 1 received treatment for ten days before the smear finally became negative. In this group treated with sulfadiazine lozenges the average time of disappearance of Vincent's organisms from the smears was 7.1 days.

The patients treated with penicillin locally (group 3) responded much more rapidly, as indicated in the chart. Smears were negative before the sixth day in all patients except 1, and this patient was clinically well on the fourth day of penicillin treatment with a large reduction in the number of Vincent's organisms found in the stained slide. However, occasional Vincent's spirilla and fusiform bacilli were seen on the smears on the eleventh day. Excluding this 1 case the average time of disappearance of the organisms from the smear was 3.7 days.

The patient in group 4 who received 15,000 units of penicillin intramuscularly every three hours for eight doses made the most rapid response to treatment of any of the patients in the first three groups. Following the initial treatment subjective symptoms disappeared in six hours and tenderness ceased in eight hours; the smears became essentially negative in eight hours, and fusiform bacilli and spirilla could not be found after eleven hours.[6]

COMMENT

The present clinical study demonstrates that penicillin is a remarkably effective agent in the treatment of Vincent's infection.

The efficacy of penicillin in Vincent's angina is of importance not only because of special sensitivity of Vincent's spirilla and fusiform bacilli but also because it is more rapidly effective than the methods heretofore advocated.

A favorable response was obtained in all cases treated locally. The only bacteriologic failure occurred in a patient who had organisms of Vincent's persist even after eleven days of local treatment, although the patient was clinically cured on the fourth treatment day.

In 1 case the effect was dramatic in that the subjective symptom of pain disappeared within six hours after the start of intramuscular treatment. The fact that symptoms disappeared within six hours after the onset of therapy and that the hourly quantitative bacterial study showed a rapid disappearance of the Vincent's organisms while receiving 15,000 units of

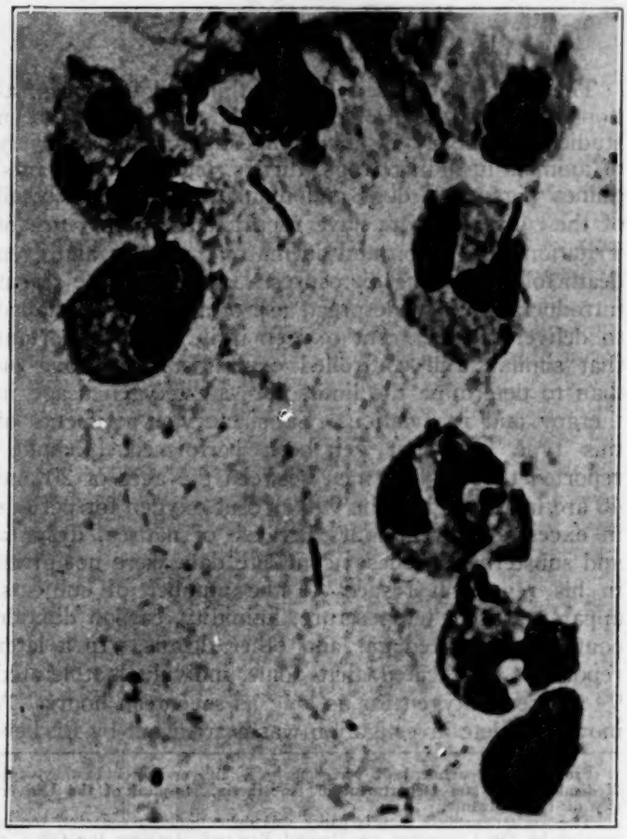

Fig. 5.—Appearance seven hours after the institution of treatment.

penicillin intramuscularly every three hours for eight doses suggest that this is a rapidly effective method of treatment of Vincent's angina. The duration of hospitalization was much reduced by this method of treatment when compared with sulfadiazine lozenges,

6. Subsequent to the time this paper was forwarded to the publisher, 2 additional cases, similar to the second case in group 4, have been observed. The treatment consisted in the intramuscular injection of 25,000 units and 20,000 units, respectively, administered every three hours for a total dosage of 100,000 units. The bacteriologic and clinical responses were so dramatic that the administration of 25,000 units of penicillin for four doses at three hour intervals is apparently the optimal treatment of Vincent's angina.

hydrogen peroxide and sodium perborate, chromic acid and silver nitrate, and oxophenarsine hydrochloride therapy.

The experience with this group of cases seems to justify the conclusion that topical application of penicillin in a concentration of 500 units per cubic centimeter applied four times daily is completely and rapidly effective therapeutic procedure in the treatment of Vincent's infection. As a result of our detailed study of 1 patient during the administration of 15,000 units every three hours for eight doses, it is suggested that this method of treatment warrants extended trial.

OXYGEN TOXICITY

THE EFFECT OF INHALATION OF HIGH CONCENTRATIONS OF OXYGEN FOR TWENTY-FOUR HOURS ON NORMAL MEN AT SEA LEVEL AND AT A SIMULATED ALTITUDE OF 18,000 FEET

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The effects produced by breathing high concentrations of oxygen for prolonged periods of time have been studied intensively by many investigators in a variety of animals including frogs, turtles, pigeons, mice, rats, guinea pigs, cats, dogs and monkeys.[1] Practically all of these investigators have reported the occurrence of irritation, congestion and edema of the lungs and even death following long exposures. Because of the recent introduction and widespread use of apparatus designed to deliver 100 per cent oxygen it is highly important that similar well controlled experiments be done on man to determine the limits for safe oxygen usage in therapy and in aviation. Satisfactory experiments of this type have not yet been performed. Behnke[2] reported that healthy men between the ages of 20 and 40 are unable to breathe 99 per cent oxygen for periods in excess of seven hours because of nausea, dyspnea and substernal soreness; complete data were not given in his report in respect to the number of subjects, apparatus used, temperature, humidity, carbon dioxide content of inspired gas and other details. In a later report he[3] indicated that some individuals tolerated 99 per cent oxygen for as long as seventeen hours. A more complete investigation was carried out by Becker-Freyseng and Clamann[4] on 2 men breathing 90 per cent oxygen for sixty-five hours. The vital capacity was reduced in both, and 1 developed nausea, repeated vomiting, tachycardia, a febrile tracheobronchitis, dyspnea and pain in the elbows and knees. Neither Behnke nor Becker-Freyseng and Clamann employed controls breathing room air under identical circumstances.

These reports by Behnke and Becker-Freyseng and Clamann are at variance with the clinical opinion of Boothby,[5] who has "employed 100 per cent oxygen continuously for forty-eight hours in more than 800 patients without toxic actions," and of Evans,[6] who has never observed any untoward effects in more than 800 patients receiving 100 per cent oxygen therapy. However, we must point out that patients rarely if ever receive 100 per cent oxygen continuously for several reasons: 1. The mask is usually removed every two to three hours for feeding, drug administration or nursing care. The use of the word continuous by some authors is therefore not justified. 2. The B. L. B. nasal mask[7] may deliver 40 to 95 per cent oxygen, depending on whether the mouth is open (eating, talking, snoring) or closed. 3. The B. L. B. oronasal mask does not necessarily deliver 99 per cent oxygen because it employs partial rebreathing through a reservoir bag and because it permits outside air to be drawn through the sponge rubber disks when the respiratory volume of the subject is in excess of the volume delivered by the oxygen regulator. The same is true of the O. E. M. mask;[8] when demand exceeds the rate of flow the bag is collapsed and air is drawn in through the safety valve. 4. Neither the B. L. B. nor the O. E. M. mask fits the face tightly enough to exclude room air unless special precautions are taken in the fitting of the mask; this is particularly true in individuals with thin bony faces or with edentia. 5. The B. L. B. and O. E. M. oxygen masks may easily be displaced in sleep, and we have repeatedly seen persons (theoretically receiving 100 per cent oxygen) whose masks were on a cheek or the chin during sleep while the mouth or nose was completely uncovered. 6. Masks are often removed deliberately or unconsciously by anoxic patients.

For all these reasons, unless patients are observed by competent investigators continuously for twenty-four or forty-eight hours, with frequent analyses of mask air for percentage of oxygen, these observations[9] cannot be used as arguments against the possible occurrence of oxygen toxicity in man.

We therefore undertook to study with continuous observations a large series of normal men exposed to 98 to 99.5 per cent oxygen for twenty-four hours, with a sufficient number of controls to enable us to state with certainty that oxygen does or does not produce toxic symptoms when so given.

METHODS

Ninety healthy young men between the ages of 19 and 31 years were used; all of these subjects were under continuous observation for twenty-four hours by

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Col. C. P. Rhoads and Major Louis Venet, Medical Division, Chemical Warfare Service, furnished much of the apparatus used. Messrs. Dunne and Levin of the Paschall Oxygen Company, Philadelphia, prepared most of the oxygen mixtures used in the experiments. Elizabeth Parcels performed the hematologic studies. Dr. David Drabkin performed the spectrophotometric determinations of total blood pigments. Mr. Herbert Hadley made available civilian public service volunteers. Miss P. Walker rendered valuable technical assistance.

1. Bean, J. W.: Effects of Oxygen at Increased Pressure, Physiol. Rev. **25**: 1-147 (Jan.) 1945.
2. Behnke, A. R.: High Atmospheric Pressures: Physiological Effects of Increased and Decreased Pressures; Application of These Findings to Clinical Medicine, Ann. Int. Med. **13**: 2217-2228 (June) 1940.
3. Behnke, A. R., and Willmon, T. L.: Gaseous Nitrogen and Helium Elimination from the Body During Rest and Exercise, Am. J. Physiol. **131**: 619-626 (Jan.) 1941.
4. Becker-Freyseng, H., and Clamann, H. G.: Zur Frage der Sauerstoffvergiftung, Klin. Wchnschr. **18**: 1382-1385 (Oct. 28) 1939.
5. Boothby, W. M.; Mayo, C. W., and Lovelace, W. R.: One Hundred per Cent Oxygen: Indications for Its Use and Methods of Its Administration, J. A. M. A. **113**: 477-482 (Aug. 5) 1939.
6. Evans, J. H.: The War and Oxygen Therapy, New York State J. Med. **44**: 2443-2451 (Nov. 15) 1944.
7. Boothby, W. M.; Lovelace, W. R., and Bulbulian, A. H.: Oxygen Administration and Therapeutic Use: III. The Design and Construction of Masks for Oxygen Inhalation Apparatus, Proc. Staff Meet., Mayo Clin. **13**: 654-656 (Oct. 12) 1938.
8. Barach, A. L., and Eckman, M.: A Mask Apparatus Which Provides High Oxygen Concentrations With Accurate Control of the Percentage of Oxygen in the Inspired Air and Without Accumulation of CO_2, J. Aviation Med. **12**: 39-52 (March) 1941.
9. Boothby, Mayo and Lovelace.[5] Evans.[6]

one or more of us. All our experiments were carried out at 1 atmosphere pressure (sea level) unless otherwise noted.

The first six experiments were performed singly. Each of the 6 subjects was placed at complete bed rest in a Heli-Ox hood closed circuit rebreathing apparatus.[10] Carbon dioxide was absorbed completely by baralyme. In addition to other measurements to be discussed later, oxygen and carbon dioxide concentrations, temperature and relative humidity within the hood, and pulse and respiratory rate were recorded at least once every thirty minutes.

In the other eighty-four experiments gas mixtures were administered through a demand system set at 1 inch of water positive pressure on inspiration, employing the Army gas mask with expiratory valve but without the customary canister. This is a full face mask and possesses the advantages of sealing tightly even during sleep, regardless of the shape or contours of the face, and of having a large enough dead space (300 to 400 cc.) to act as an excellent humidifier. Oxygen and carbon dioxide analyses were performed on the Scholander analyzer,[11] using samples withdrawn from the mask during inspiration. The carbon dioxide percentage occasionally exceeded 1 in 49 subjects, 1.5 in 28 and 2 in 5 subjects; 85 per cent of all carbon dioxide determinations in all subjects were less than 1.5 per cent of carbon dioxide, and only 3 per cent exceeded 2 per cent of carbon dioxide. An oxygen distributing line was used so that 20 men could receive the gas mixtures during the same twenty-four hour period. This permitted a large number of controls to be run simultaneously with the subjects receiving high oxygen concentrations. Oxygen was obtained from two different manufacturers; it was prepared by distillation of liquid air and supplied in medicinal cylinders of 240 or 300 cubic feet capacity.

All of these 84 individuals were studied with respect to symptomatology, vital capacity, pulse rate and physical examination of the chest. Complete venous blood studies (red blood cells, white blood cells, hemoglobin, differential, reticulocytes, hematocrit) were performed on 38 of these subjects.

Measurements of relative humidity of mask or hood air were made on representative subjects. No effort was made to provide unusually moist or dry air. The subjects in the hood breathed air with a relative humidity of 44 to 79 per cent (average 68 per cent); the hood temperature was usually 21 C. The relative humidity of the gas breathed by those wearing masks ranged from 38 to 47 per cent (average 40 per cent); this was determined by measuring the temperature of inspired air inside the mask (31 C.) and the dew point of small samples of air withdrawn from the mask during twenty consecutive inspirations. Actually the average amount of moisture contained in the gas breathed by the masked groups (13.1 Gm. of water per cubic meter) was greater than in the hood group (12.3 Gm. of water per cubic meter). Since the alveoli saturate the incoming air with water vapor at 37 C., it is the moisture content in grams of water per cubic meter of gas that determines the drying action. In this instance air with a relative humidity of 40 per cent contained more moisture than air with a relative humidity of 68 per cent; this is due to the fact that the temperature in the former was greater than in the latter. Consequently all the subjects in these experiments were breathing moist gases.

The 84 men wearing masks were permitted to be ambulatory to the extent of their 6 foot hose line. All 90 subjects slept six to twelve hours of the twenty-four. The masks or hood were not removed for feeding, which was accomplished by providing 1,500 to 4,000 cc. of liquid diet (soup, milk, eggnog, fruit juices, coffee, tea, water) via a tube or catheter sealed into the hood or inserted under the gas mask flap and held in place to prevent leakage. Descriptions of symptoms experienced were volunteered by the subjects and never elicited by leading questions. All of the subjects including the controls breathing air were told that they were breathing 100 per cent oxygen regardless of the concentration actually provided.

RESULTS

The data will be discussed from two points of view:

(A) Symptoms produced by inhalation of the gas mixtures and

(B) The effects of high concentrations of oxygen on the blood, circulation and respiration.

A. *Symptoms.*—1. Substernal Distress: Thirty-four subjects (6 in hood and 28 wearing masks) inhaled 100 per cent oxygen[12] continuously for twenty-four hours. The most prominent symptoms during the period was substernal distress. Four of the 6 men in the hood and 24 of 28 subjects wearing masks complained of this discomfort. It was considered slight in 4, of moderate intensity in 18 and severe in 6. It was characterized as a substernal ache which often became sharp and severe during inspiration. The sensations were described as follows: "felt as though I had been smoking excessively," "as though breathing raw, cold air," "as though I had just run a race to the point of exhaustion," "felt like bronchitis." The symptoms were quite similar to those of mild "chokes." The substernal distress was noted at an average time of fourteen hours after the start of the oxygen, the range being from four hours to twenty-two; 79 per cent of those developing substernal distress first noticed this symptom between the twelfth and the sixteenth hour. It was never severe enough to necessitate discontinuance of the experiment before the end of the twenty-four hour period. In some subjects the discomfort diminished as the experiment proceeded, but in the majority signs of greater irritation became evident. In some of the latter the pain increased in severity until it became continuous; in these a deep breath led to coughing or was so uncomfortable as to force the subject to limit his respiratory excursion.

Pain was localized to the right or left of the sternum in a small group, but in the majority of instances it was in the midsternal area. In a few cases the discomfort was centered above the sternal notch "in the throat" or "in the neck." Eight subjects noted aggravation of the discomfort when the mask was removed at the end of the experiment. A similar phenomenon was noted in one instance by Behnke.[3] It is possible that the inhalation of unfiltered, cooler, drier room air containing dust was responsible for this.

10. Barach, A. L.: Principles and Practices of Inhalation Therapy, Philadelphia, J. B. Lippincott Company, 1944.
11. Scholander, P. F.: Analyzer for Quick Estimation of Respiratory Gases, J. Biol. Chem. **146**: 159-162 (Nov.) 1942.

12. The mask air contained 0.5 to 1.5 per cent nitrogen or argon and the small amounts of carbon dioxide mentioned. The concentration of oxygen inspired in the experiments conducted in the hood was 98.5 to 99.5 per cent of oxygen; in the experiments employing the masks, it was 97.5 to 99.0 per cent of oxygen. However, for purposes of brevity these individuals will be referred to throughout the paper as the "100 per cent oxygen" group.

An almost universal complaint in the postexperimental period was an accentuation of the substernal distress by deep inspiration, by breathing cold air or by smoking. The symptoms then gradually decreased in intensity over a period of four to five hours, with total disappearance at the end of twelve hours except in 3 men, who had symptoms which persisted for sixteen, twenty-four and thirty-one hours.

An attempt was made to discover whether these symptoms were due to the high tension of oxygen or to adventitious circumstances such as the apparatus used, humidity, resistance to respiration or substances carried over from the tubing or cylinders. To determine this, 10 men breathed compressed room air continuously for twenty-four hours at the same time as 10 of the 28 mentioned before. The oxygen and air cylinders were filled by the same manufacturer and were selected from standard stocks of medicinal oxygen cylinders; the regulators, the copper and rubber tubing, the demand valves and the oxygen masks were identical in the two groups; the relative humidity and carbon dioxide concentrations of the inspired air were the same in the two groups; the groups were observed under the same external environment and with similar fluid intakes, and both groups thought they were breathing 100 per cent oxygen. Nevertheless 9 of the 10 men breathing 100 per cent oxygen developed substernal distress, while none of the 10 breathing air had any corresponding symptoms during the twenty-four hour period. This shows conclusively that the substernal distress was due to inhalation of 100 per cent oxygen.

We then tried to determine the percentage of oxygen required to produce substernal distress. Nine men inhaled 75 per cent oxygen with a fifteen minute intermission every three hours for twenty-four hours and 10 men 50 per cent [13] oxygen continuously for a similar period. Five of the 9 subjects breathing 75 per cent oxygen developed this characteristic symptom, while none of the 10 exposed to 50 per cent oxygen had any complaints referable to the chest. It appears that the concentration of oxygen required to produce symptoms in normal men lies between 50 and 75 per cent and probably is close to the 60 per cent level estimated as safe by Bean [1] and by Stadie.[14]

Since exposure to gas mixtures low in nitrogen results in elimination of nitrogen from alveoli, blood and tissues, it was considered possible that the low tension of nitrogen rather than the increased amount of oxygen might be responsible for the chest pain. Accordingly 6 men were placed in a low pressure chamber at a simulated altitude of 18,000 feet (total pressure of 380 mm. of mercury) and given 100 per cent oxygen through masks. This resulted in a low nitrogen tension and an oxygen tension roughly equivalent to that obtained in the inspired air when breathing 50 per cent oxygen at sea level. None of the 6 subjects developed any substernal discomfort during the twenty-four hour period. It must therefore be concluded that it is the presence of high tensions of oxygen (in excess of 380 mm. or 50 per cent oxygen at sea level) which is required to produce the symptoms mentioned.

It is interesting to note that while none of those breathing 21 per cent or 50 per cent oxygen at sea level or 100 per cent oxygen at 380 mm. had substernal discomfort during the twenty-four hour period, 1, 5 and 2 subjects in these groups respectively had very slight temporary discomfort after the experiment either during the measurement of vital capacity or on going out into cold air. It is possible that prolonged breathing through the rubber tubing or apparatus produced a very mild subclinical irritation.

It has been suggested [15] that intermittent administration of oxygen is less harmful than continuous oxygen therapy. In order to obtain further information on this point we administered 100 per cent oxygen as follows: (*a*) 7 men were given intermissions of one minute every three hours, (*b*) 7 men were given intermissions of five minutes every three hours and (*c*) 7 men were given intermissions of fifteen minutes every three hours. All 21 subjects breathed oxygen for a total of twenty-four hours, i. e. the intermission periods were added to the total time. The masks were removed and room air was breathed during the intermissions. There was no significant difference between any of these groups and those who received oxygen continuously. Of the 7 with one minute intermissions 6 developed substernal distress, of the 7 with five minute intermissions all developed this symptom and of the 7 with fifteen minute intermissions 6 were similarly affected. It is of interest to note that 8 of 30 subjects who breathed 75 or 100 per cent oxygen intermittently noted aggravation of symptoms during the intermission while breathing room air and amelioration when the oxygen inhalation was resumed; 4 subjects with substernal pain were improved in the intermission period and the remainder noted no definite change in symptoms during intermissions.

As far as total incidence of symptoms (mild, moderate or severe) is concerned there appears to be no significant difference between those given 100 per cent oxygen continuously or with intermissions (chart 1). However, if the symptoms are graded according to their intensity (chart 2) those occuring in the group given 100 per cent oxygen with eight rest periods of fifteen minutes each appear to be less severe.

2. Cough, Sore Throat and Nasal Congestion: Forty-three per cent of those breathing 100 per cent oxygen continuously developed nasal congestion or coryza during or shortly after the twenty-four hour experiment; only 10 per cent of those breathing room air developed similar symptoms. Thirty-two per cent of those breathing 100 per cent oxygen developed sore throat and 54 per cent had occasional or repeated cough; 20 per cent of those breathing room air developed sore or dry thoat and none coughed. The development of these symptoms bore no relation to a person's tendency toward upper respiratory tract infection. It is interesting to note that there is not a striking difference between the control group and the 100 per cent oxygen group in respect to throat irritation. The incidence of upper respiratory tract symptoms in the control group breathing room air may be due to inhalation of volatile substances in rubber or to inability to expectorate or blow the nose or to the fact that the experiments were carried out in December and January, when a certain amount of respiratory infection is to be expected.

3. Eye Irritation: Conjunctival irritation occurred in 23 per cent of those breathing 100 per cent oxygen and in 10 per cent of those breathing room air. Part of this may be attributed to the fact that the gas masks

13. The percentage oxygen (mask analyses) varied from 75 to 79 of oxygen and from 49 to 53 of oxygen.

14. Stadie, W. C.; Riggs, B. C., and Haugaard, N.: Oxygen Poisoning, Am. J. M. Sc. **207**: 84-114 (Jan.) 1944.

15. Paine, J. R.; Keys, A., and Lynn, D.: Observations on the Effects of the Prolonged Administration of High Oxygen Concentration to Dogs, J. Thoracic Surg. **11**: 151-168 (Dec.) 1941. Barach, A. L.; Eckman, M.; Oppenheimer, E. T.; Rumsey, C., Jr., and Soroka, M.: Observations on Methods of Increasing Resistance to Oxygen Poisoning and Studies of Accompanying Physiological Effects, Am. J. Physiol. **142**: 462-475 (Oct.) 1944.

conducts the inspired air directly over the eye pieces; part may be ascribed to the irritancy of oxygen per se. The difference between the two groups is not significant.

4. Lower Respiratory Tract Damage: Since high concentrations of oxygen may irritate the conjunctiva, nose, throat, trachea and bronchi of man and since it is known that they may produce pulmonary congestion and edema in animals, it seemed important to determine whether alveolar damage resulted in man. The distribution of the substernal pain, its aggravation by inhalation of dry, cool ambient air, by cigarets and deep breathing strongly suggest the existence of a tracheobronchitis. In an attempt to determine coexistence of alveolar damage we measured vital capacity before and after the experiment on each subject; three or four determinations were made at each time, and the average of the two highest was recorded. The vital capacity of each of the 10 control subjects breathing room air increased, the average being 210 cc., at the end of the twenty-four hour experimental period (chart 3). This increase is probably attributable to the fact that the original vital capacity was determined on all subjects within thirty minutes after their evening

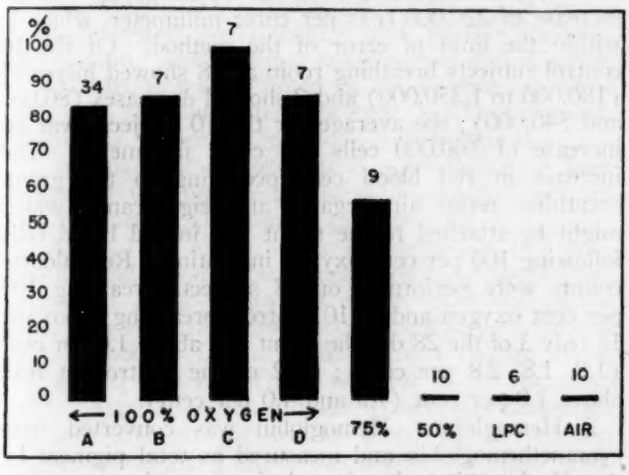

Chart 1.—Incidence of substernal discomfort: Solid bars show the percentage of subjects in each group who developed substernal discomfort during the twenty-four hour inhalation. The first four groups inhaled 100 per cent oxygen; of these group A breathed oxygen continuously for twenty-four hours, group B had a one minute intermission every three hours, group C five minute intermission every three hours and group D fifteen minute intermission every three hours. 75 % indicates inhalation of 75 per cent oxygen, 50, 50 per cent oxygen. *LPC* indicates inhalation of 100 per cent oxygen in a low pressure chamber at 18,000 feet. *AIR* indicates inhalation of compressed air. The numbers above each bar indicate the number of subjects in each group.

meal, while the final measurement was made after twenty-four hours of a liquid diet with no intake at all during the last two to three hours. The relatively empty gastrointestinal tract presumably allowed the diaphragm to descend farther and enabled the subject to take a deeper breath or to expel more completely the inspired air.

In contrast to these findings, 63 of the 80 subjects breathing 50, 75 or 100 per cent oxygen showed a decreased vital capacity. In 38 subjects the diminution amounted to more than 200 cc., in 26 to more than 300 cc. and in 15 to more than 400 cc. (the maximal decrease was 1,480 cc. in 2 instances). In view of the data obtained in the group breathing room air it seems fair to assume that the base line for comparison should be plus 200 cc. This accentuates the diminution in vital capacity found in the subjects breathing increased concentrations of oxygen. Furthermore, in those subjects breathing 100 per cent oxygen abdominal distention should have been at a minimum, since Fine and his associates [16] have shown that this procedure leads to absorption of nitrogen from the gastrointestinal tract and a decrease in bowel lumen; this should permit easier descent of the diaphragm and increase the vital capacity. The decreased vital capacity observed

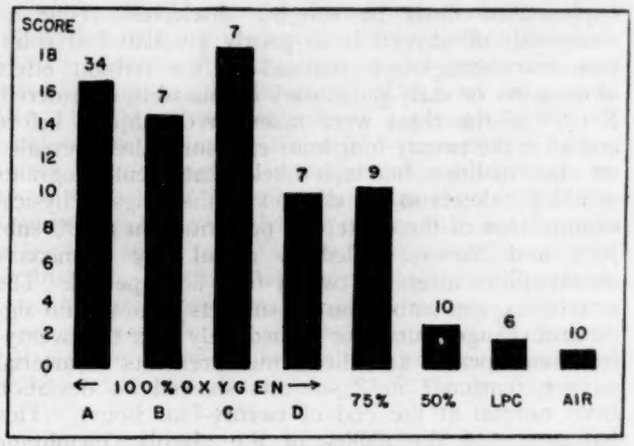

Chart 2.—Severity of substernal discomfort: The groups are the same as in chart 1. Severity of symptoms has been rated as follows: severe discomfort during the experiment 30 points, moderate discomfort 20 points, mild discomfort 10 points, slight temporary discomfort occurring only after the twenty-four hour experiment 5 points. The total score in each group was divided by the number of subjects of each group to determine the average severity per subject.

in men breathing higher concentrations of oxygen is therefore significant.

The cause of this reduction in vital capacity is not certain. In some instances the subject was unwilling to make a maximal inspiratory effort because of pain. More often, however, the decrease in vital capacity bore no relationship to the severity of the substernal distress. Thus, of 26 instances in which the vital capacity was decreased more than 300 cc., in only 5

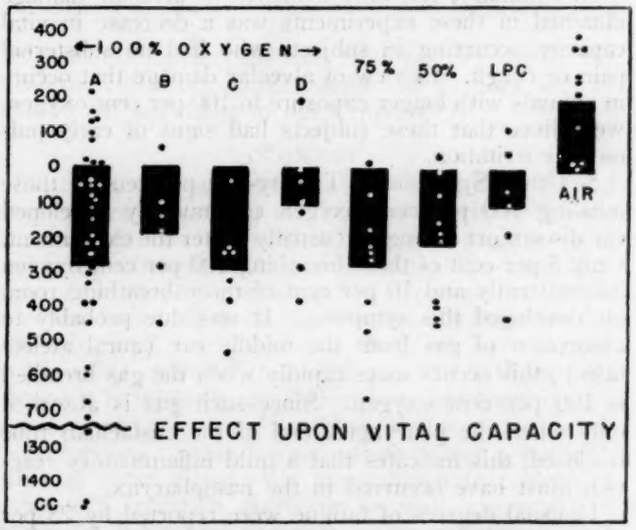

Chart 3.—The groups are the same as in charts 1 and 2. The individual variations in vital capacity from the beginning to the end of the experiment and the average for each group are shown. Above zero represents an increase in vital capacity, below represents a decrease.

was the substernal distress severe, in 9 it was moderate, in 4 slight and in 8 lacking entirely. Among 15 subjects in whom the vital capacity was decreased more

16. Fine, J.; Hermanson, L., and Frehling, S.: Further Clinical Experiences with 95 per Cent Oxygen for the Absorption of Air from the Body Tissues, Ann. Surg. **107**: 1-13 (Jan.) 1938.

than 400 cc., only 4 had severe distress, 5 had moderate discomfort, 2 slight and 4 none at all. Conversely, of the 26 subjects who had no substernal distress during inhalation of 50 to 100 per cent oxygen 7 had a decrease in vital capacity of more than 380 cc.

Since the decreased vital capacity could not be correlated positively with substernal distress, other explanations must be sought. Atelectasis (due to absorption of oxygen from poorly ventilated alveoli), pulmonary congestion (caused by the irritant effect of oxygen) or early pulmonary edema were considered. X-rays of the chest were taken in 6 subjects before and after the twenty-four hour exposure; these revealed no abnormalities, but it is likely that roentgenograms would not detect minor changes in the lungs. Physical examination of the chest was performed in all 90 subjects and likewise failed to reveal any pulmonary abnormalities after the twenty-four hour period. The arterial oxygen saturation (6 subjects) showed no significant changes during or immediately after the twenty-four hour period and direct measurements of arterial oxygen tension [17] in 2 subjects showed no deviation from normal at the end of twenty-four hours. This indicates that the ability of the alveolar membrane to transport oxygen was not interfered with. The minute volume of respiration was measured in 6 subjects breathing room air before and immediately after the twenty-four hour exposure to 100 per cent oxygen in the hood. It was increased after the experiment in only 2 of the 6; 1 of these had a 13 per cent increase in minute volume and a 33 per cent increase in rate, and the other had a 25 per cent increase in minute volume and a 20 per cent increase in rate. The former had very severe symptoms and a decreased vital capacity of 1,480 cc.; the latter had neither. Since pronounced changes in vital capacity must occur before minute volume is definitely increased,[18] respiratory changes are not sensitive indicators of pulmonary atelectasis, congestion or edema.

In summary, the only evidence of alveolar damage obtained in these experiments was a decrease in vital capacity occurring in subjects who had no substernal pain or cough. In view of alveolar damage that occurs in animals with longer exposure to 100 per cent oxygen, we believe that these subjects had signs of early pulmonary irritation.

5. Other Symptoms: Twenty-five per cent of those inhaling 100 per cent oxygen continuously developed ear discomfort during or (usually) after the experiment. Only 5 per cent of those breathing 100 per cent oxygen intermittently and 10 per cent of those breathing room air developed this symptom. It was due probably to absorption of gas from the middle ear (aural atelectasis); this occurs more rapidly when the gas breathed is 100 per cent oxygen. Since such gas is absorbed only when the pharyngeal end of the eustachian tube is closed, this indicates that a mild inflammatory reaction must have occurred in the nasopharynx.

Unusual degrees of fatigue were reported by 25 per cent of those breathing 100 per cent oxygen continuously and by 10 per cent of those breathing room air. Five subjects noted joint pains or crackling in the joints during or after the breathing of 100 per cent oxygen for twenty-four hours; these complaints were similar to early signs of bends. Three subjects noted paresthesias such as tingling in the extremities while breathing 100 per cent oxygen; these symptoms were similar to those commonly noted in decompression sickness. Muscle pains in the legs were noted by 4 subjects, hoarseness by 2, palpitation (on exercise) by 3, aching or sensitive teeth by 7, dizziness or lightheadedness in the postexperimental period by 7. None of these symptoms occurred in subjects breathing room air.

B. *Effects of High Concentrations of Oxygen on Other Body Systems.*—1. Red Blood Cells: Red blood cells were counted before and after inhalation of 100 per cent oxygen for twenty to twenty-four hours by 28 subjects and before and after inhalation of room air by 10 subjects. All of the blood studies were carried out on venous blood samples. Duplicate analyses were made. The preexperiment bloods were drawn between 6 and 7 p. m. (after the evening meal); the second sample was taken while the subject was still breathing gas between the twentieth and twenty-fourth hours of the experiment. In the group of 28 breathing 100 per cent oxygen, 19 showed increases in red blood cells ranging from 60,000 cells per cubic millimeter to 1,210,000, and 9 showed a decrease ranging from 40,000 to 640,000; the average for the whole group was an increase of 220,000 cells per cubic millimeter, which is within the limit of error of the method. Of the 10 control subjects breathing room air, 8 showed increases (180,000 to 1,350,000) and 2 showed decreases (80,000 and 540,000); the average for the 10 subjects was an increase of 560,000 cells per cubic millimeter. The increase in red blood cells occurring in the group breathing room air negates any significance which might be attached to the slight rise in red blood cells following 100 per cent oxygen inhalation. Reticulocyte counts were performed on 28 subjects breathing 100 per cent oxygen and in 10 controls breathing room air. In only 3 of the 28 did the count rise above 1.0 per cent (1.2, 1.8, 2.8 per cent); in 2 of the controls it rose above 1.0 per cent (1.5 and 4.0 per cent).

2. Hemoglobin: Hemoglobin was converted into cyanmethemoglobin and measured as total pigment by the Evelyn photoelectric colorimeter using constants obtained by comparison with the spectrophotometric method of Drabkin.[19] Of 28 subjects breathing 100 per cent oxygen, in 12 an increase occurred (0.15 Gm. to 0.89 Gm.) and in 15 a decrease occurred (0.13 Gm. to 1.67 Gm.); in 1 there was no change. The average of all 28 showed a decrease of 0.13 Gm. Of the 10 controls breathing room air, in 6 the hemoglobin increased (0.13 to 0.78) and in 4 it decreased (0.06 to 0.85); the average was an increase of 0.11 Gm. These average changes are not significant. It is interesting to note that hemoglobin determinations (done by a very accurate method) may vary by almost 1 Gm. on two successive days even though breathing room air. This confirms the observations of Dreyer and his associates [20] and of Rabinowitch.[21]

3. Hematocrit: Hematocrit determinations were done on 27 subjects breathing 100 per cent oxygen; 16 showed an increase (0.2 to 4.6 per cent), 10 showed a decrease (0.1 to 3.6 per cent) and 1 showed no change. The average change was an increase of 0.36

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18. Comroe, J. H., Jr.: The Hyperpnea of Muscular Exercise, Physiol. Rev. **24**: 319-339 (July) 1944.

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20. Dreyer, G.; Bazett, H. C., and Pierce, H. F.: Diurnal Variations in the Hemoglobin Content of the Blood, Lancet **2**: 588-591 (Sept. 18) 1920.

21. Rabinowitch, I. M.: Variations of the Percentage of Hemoglobin in Man During the Day, J. Lab. & Clin. Med. **9**: 120-123 (Nov.) 1923.

per cent. Similar determinations were performed on the subjects breathing room air; 5 increased (0.6 to 4.8 per cent) and 5 decreased (0.2 to 1.9 per cent). The average was an increase of 0.55 per cent.

4. White Blood Cells: Of the group of 28 breathing 100 per cent oxygen, the white blood cells count did not change in 3, increased in 7 (by 100 to 6,100 cells per cubic millimeter) and decreased in 18 (by 100 to 3,200 cells per cubic millimeter). The average change was a decrease of 190 cells per cubic millimeter. The apparent decrease in white blood cells postexperimentally was probably due to the fact that the control blood was obtained one hour after the evening meal and the white blood cells were slightly elevated at this time in response to food. This explanation is strengthened by the fact that in the group of 10 controls breathing room air the white blood cells decreased in 7 (by 50 to 2,900 cells per cubic millimeter) and increased in only 3 (100 to 3,500); the average decrease was 440 cells per cubic millimeter. The highest absolute level to which the white blood cells rose in the group breathing 100 per cent oxygen was 12,400 in 1 case (this subject had only slight substernal discomfort); in only 2 other instances did the white blood cells rise over 10,000 (10,350 to 10,100). The leukocytosis described by Behnke [2] and Becker-Freyseng and Clamann [4] was therefore not observed in this series. No abnormalities were noted in the differential white blood cells (granulocytes, filament and nonfilament, lymphocytes, monocytes, eosinophils or basophils).

In summary, it is apparent that inhalation of high concentrations of oxygen for twenty-four hours does not affect the formed elements of the blood.

5. Arterial p_H and Carbon Dioxide: In two subjects, arterial blood p_H was measured in a closed glass electrode at 38 C. before and at the conclusion of the twenty-four hour period of 100 per cent oxygen inhalation. In neither instance was there a change in p_H greater than 0.01 unit (limit of error of the measurement). Arterial carbon dioxide tension was calculated from measurements of arterial blood p_H and carbon dioxide content; in 1 there was a decrease of 0.7 mm. of mercury and in the other an increase of 1.0 mm. of mercury. Arterial whole blood carbon dioxide content was measured before and at the end of the twenty-four hour period of oxygen inhalation in 6 subjects; in 2 there was no change, in 1 an increase and in 3 a decrease; the average change was a decrease of 1.03 volumes per cent.

6. Pulse: A slowing of the pulse has been reported [22] during the inhalation of 100 per cent oxygen. This has been confirmed in this study, but since the control subjects breathing room air showed a bradycardia to the same degree it is obvious that this pulse slowing represents the effect of bed rest rather than of the gas breathed (table 1).

The figures in the last two columns were obtained as follows: At the end of the experiment the subjects were put at complete rest for fifteen to forty-five minutes while still breathing the gas and a pulse count was taken; then the mask was removed and the subject continued resting for another fifteen to forty-five minutes and the second count (room air) taken. In no case was there any significant increase in pulse on changing from oxygen to room air.

7. Blood Pressure: In 28 subjects breathing 100 per cent oxygen and in 10 breathing room air the blood pressure was determined before the experiment (twenty minutes' rest), at the end of the twenty-four hour period (twenty minutes' rest) and twenty minutes after removal of the mask. The average figures are shown in table 2. These figures show no significant trend in blood pressure as a result of inhalation of 100 per cent oxygen.

8. Respiration: In the 84 subjects wearing masks respiration was not measured quantitatively, but there was no instance in which dyspnea or hyperpnea was noted by subjects or observers. The total number of liters of oxygen used per subject in twenty-four hours could not be measured accurately because of wastage during tube feeding but corresponded roughly with the calculated amount for subjects at partial rest. In the 6 subjects in the hood, the respiratory rate was counted at least twice an hour for the twenty-four hours. In no instance did the respiratory rate increase above normal figures during the period of oxygen inhalation. These findings do not controvert previous findings [23] that oxygen increases respiratory minute volume by 10 to 15 per cent, for the experimental conditions in this work do not compare with the former; however, the break in respiratory compensation and dyspnea seen by others [2] did not occur in our experiments.

TABLE 1.—*Effect of 100 per Cent Oxygen on Pulse as Compared with Controls*

	Before Experiment	Lowest During Experiment	End of Experiment, 15′ Rest	After Experiment, 30-40′ Rest
100% oxygen				
Hood (average 6 men).....	69	49	61.6	60.8
Mask (average 28 men).....	80.5	55.5	65.6	67.3
Room air				
Mask (average 10 men).....	80.6	56.2	63.6	67.2

TABLE 2.—*Effect of 100 per Cent Oxygen on Blood Pressure as Compared with Controls*

	Before Experiment	End of Experiment	After Experiment
100% oxygen (28 men).....	128/76	127/75	122/76
Room air (10 men).....	126/78	120/76	119/80

COMMENT

There is no agreement whatever among clinical investigators concerning the harmful effects of oxygen on man. At one extreme Behnke has reported that healthy men between the ages of 20 and 40 are not able to breathe 99 per cent oxygen for periods in excess of seven hours, dyspnea, flushing of the face, nausea and substernal soreness terminating his experiments. At the other extreme are statements that 100 per cent oxygen is harmless in man when breathed continuously for forty-eight hours (Boothby) or even for much longer periods (Evans). Our results do not agree with either of these views. We have shown that signs of respiratory irritation do occur in man, characterized chiefly by substernal soreness. The average time of onset was not seven hours but fourteen hours, and all of the subjects were able to tolerate this discomfort for the full twenty-four hour period. As is the case with animals, there appears to be a factor of individual variation, some subjects having severe symptoms and a few

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23. Shock, N. W., and Soley, M. H.: Effect of Breathing Pure Oxygen on Respiratory Volume in Humans, Proc. Soc. Exper. Biol. & Med. **44**: 418-420 (June) 1940. Watt, J. G.; Dumke, P. R., and Comroe, J. H., Jr.: Effects of Inhalation of 100 per cent and 14 per cent Oxygen on Respiration of Unanesthetized Dogs Before and After Chemoreceptor Denervation, Am. J. Physiol. **138**: 610-617 (March) 1943.

none at all. We have no explanation for the dyspnea, flushing and nausea noted by Behnke; these symptoms did not occur in our series. However, we can offer an explanation for the failure of other observers to note toxic effects from oxygen inhalation in man. As indicated previously, so-called "100 per cent" oxygen as administered clinically rarely approaches that concentration. The data of Reinhard and his associates [24] illustrate this very well. They report the administration of 70 to 100 per cent oxygen "continuously" for eight to twenty days to 4 patients with sickle cell anemia. However, while oxygen was administered for a total of seventy-two patient days, alveolar oxygen concentrations were determined only four times over this whole period (three times in 1 patient, once in another and not at all in 2 patients). Since these four analyses varied from 63.4 to 90.6 per cent oxygen, it is obvious that some might have been considerably lower, especially during sleep. It is impossible to tell whether these patients were breathing 60 to 70 per cent oxygen or 80 to 90 per cent oxygen and, since 60 per cent oxygen produces no toxic symptoms but 75 per cent may, no conclusions can be drawn from such uncontrolled observations. Their arterial blood analyses also suggest that less than 60 per cent oxygen was being inhaled, since inhalation of 100 per cent oxygen should result in at least 1.5 cc. of additional oxygen carried in the plasma over that dissolved when blood is equilibrated with room air; yet an increase in excess of 0.4 cc. was not recorded in their series. We began our investigation using several half-face masks (aviation type) and found that these often provided only 50 per cent oxygen. Clinicians must recognize the fact that just as oxygen tents leak and often provide only 30 per cent oxygen instead of 60 per cent, so masks will also leak when improperly applied. Figures relating to concentrations of inhaled oxygen are meaningless unless frequent determinations of oxygen concentrations in the mask are performed around the clock (during the patient's sleeping as well as his waking hours).

Another explanation for the failure of clinicians to observe the toxic effects of high oxygen concentrations is that patients with pneumonia or coronary occlusion may be so uncomfortable as a result of the pain of pleurisy or of cardiac ischemia that the substernal discomfort produced by oxygen may be overlooked.

Since we have shown that it is possible to provide patients with 100 per cent oxygen continuously by the use of full face mask and demand apparatus, and since such apparatus may soon be made available for clinical use, it becomes necessary to consider the advisability of this procedure. We feel that the clinician must bear in mind that oxygen is a drug and must be used in accordance with well recognized pharmacologic principles; i. e., since it has certain toxic effects and is not completely harmless (as widely believed in clinical circles) it should be given only in the lowest dosage or concentration required by the particular patient. Our results indicate that the instance of oxygen toxicity reported by Becker-Freyseng and Clamann [4] was not a chance observation and did not represent individual susceptibility but was an example of a now well defined clinical entity characterized by rhinitis, pharyngitis, substernal pain accentuated on deep breathing and pulmonary change manifested by a decreased vital capacity. Over a twenty-four hour period this pulmonary change probably is not extensive enough to result in any loss of lung function (such as proper oxygenation of the blood). While prolongation of the period of oxygen breathing to two, three or four days was not feasible in our experiments, we must assume on the basis of these twenty-four hour experiments, of Becker-Freyseng and Clamann's sixty-five hour experiments and of animal experiments, that severe pulmonary congestion and edema can result in man breathing oxygen for a sufficient period of time. In our experience the symptoms were never alarming and were rapidly reversible on cessation of the oxygen inhalation with no permanent harm resulting. This may not be true of longer exposures in normal men or even of short exposures in persons with pulmonary disease.

While we know that the tolerance of normal men to inhalation of 100 per cent oxygen continuously is in excess of twenty-four hours, we have little accurate information regarding the time required to produce pulmonary changes in lungs already damaged by inflammation or by irritant gases (industrial or war gases); we excluded from our tests all persons with rhinitis, pharyngitis or bronchitis. Until we are proved to be wrong, we think it is reasonable to assume that 100 per cent oxygen would be even more irritant when placed in contact with surfaces already damaged.

These are several dissenting points of view: (*a*) Evans [6] believes that inhalation of 100 per cent oxygen cannot be harmful to a patient with arterial anoxemia, for 100 per cent oxygen in such a case never raises the oxygen pressure to the toxic level which might be obtained in normal men. This is due to the presence of pulmonary transudate or exudate (as in pulmonary edema or bronchopneumonia), which prevents the high tension of oxygen from reaching the alveolar membrane. However, only the damaged alveoli would be thus protected from the harmful effects of high oxygen, which could still be exerted on the remaining normal alveoli or on the tracheobronchial tree. (*b*) Drinker [25] believes that the use of 100 per cent oxygen can actually aid in the resorption of pulmonary transudates. However, this is true only when the pulmonary edema is due primarily to severe anoxia with resultant increase in capillary permeability; in such instances 100 per cent oxygen would tend to reverse this process at least initially. The great majority of pulmonary transudates are not caused primarily by anoxia.

In general it may be said that there are three chief groups of indications for oxygen therapy: (1) to combat arterial anoxemia, (2) to hyperoxygenate the blood in conditions not associated with anoxemia (coronary occlusion, fever, migraine, polycythemia and so on) and (3) to eliminate nitrogen from the body (to prevent decompression sickness or to combat intestinal distention).

With respect to the first, we believe that the rational use of oxygen in anoxemic states should be governed by measurements of arterial blood oxygen saturation. The technics of arterial puncture and determination of arterial blood oxygen saturation by the Van Slyke method are simple enough to be employed more widely. It is amazing that, in an era when sulfonamide, penicillin, quinacrine (atabrine) and other types of therapy are being made more exact by studies of drug concentration in the blood, blood oxygen concentration studies are almost completely neglected in the clinic. The indication for this type of oxygen therapy is decreased saturation of the arterial blood; a high enough dose

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or concentration has been given when the oxygen saturation has returned to normal, and it is not necessary to exceed this. We believe that 100 per cent oxygen may be given with safety to all anoxemic patients for short periods. When oxygen therapy must be continued beyond a twelve hour period, the concentration should be decreased to 50 or 60 per cent unless this is insufficient properly to oxygenate the arterial blood. When unsaturation of the arterial blood persists despite inhalation of 60 per cent oxygen, 80 to 100 per cent oxygen should be given, since arterial unsaturation represents more of a threat to the patient's life than does the possibility of a tracheobronchitis due to the oxygen. We take the conservative stand that 100 per cent oxygen should be used for long periods only when lower concentrations fail to saturate the blood. Many patients given oxygen therapy are seriously ill and ultimately die; it is difficult to assess the harmful effects of oxygen in these cases [26] and at present we must transfer to the therapy of these individuals knowledge gained in dealing with normal subjects. Physicians must not construe these statements to mean that oxygen therapy in general is harmful; oxygen therapy is of great value with practically no harmful effects when used in scientifically controlled concentrations.

With respect to the second indication for 100 per cent oxygen therapy (hyperoxygenation of the blood in conditions not associated with anoxemia or lung damage) it appears safe to use 100 per cent oxygen for twenty-four hours and possibly longer, for these individuals are wholly comparable to our normal subjects. In these cases the physician should question the patient every six hours in regard to substernal distress, especially following deep breathing or removal of the mask; if not contraindicated clinically, a careful vital capacity determination should be made twice daily to detect the appearance of pulmonary congestion.

With respect to the third group (denitrogenation) there is rarely a need for prolonged breathing of 100 per cent oxygen since nitrogen is eliminated from the body within several hours. Further inhalation of 100 per cent oxygen to remove nitrogen and relieve intestinal distention should not be necessary unless the patient swallows air on removal of the mask; in our opinion other procedures, such as intubation with the Miller-Abbott tube, should be tried first before resorting to prolonged breathing of 100 per cent oxygen.

With respect to the causation of the symptoms of oxygen toxicity, we have shown for the first time in man that these symptoms are caused by the high tension of oxygen rather than by denitrogenation. Our experiments with 100 per cent oxygen at an ambient pressure of 380 mm. of mercury show that denitrogenation per se does not produce symptoms as long as the oxygen tension is not abnormally high. This indicates that prolonged inhalation of 100 per cent oxygen at high altitudes in aircraft will not be harmful because the total atmospheric pressure is so low that even though all the gas inspired is pure oxygen its total pressure will never reach the irritant level. This confirms the opinion formed by Armstrong [27] on the basis of animal experimentation.

Our experiments have not confirmed the work of those investigators who have reported significant changes in hemoglobin, red blood cells, white blood cells, reticulocyte counts, pulse or blood pressure as a result of inhalation of oxygen for long periods. We believe that those who have previously reported these changes were misled because of lack of proper controls or by the use of blood obtained by finger puncture. We found no significant change in arterial blood p_H, carbon dioxide content or carbon dioxide tension at the end of twenty-four hours oxygen inhalation; we did not obtain mixed venous blood for p_H or carbon dioxide tension determinations.

One might wonder why the inhalation of 100 per cent oxygen affects chiefly the respiratory tract. We believe this is because these are the only surfaces in the body that are exposed to 100 per cent oxygen or a pO_2 of 670 to 690 mm.; despite the high arterial blood pO_2, the average tissue tension elsewhere is probably not over 70 mm. of mercury because of the steep pO_2 gradient in the capillaries. The pulmonary membranes, on the other hand, receive the high pO_2 by direct contact with the inspired gas.

We have found that most of the masks in common use do not deliver 95 to 100 per cent oxygen as applied routinely (without special precautions or specially trained attendants). We have found that the full face mask is more suitable for prolonged administration of 100 per cent oxygen. It is easy to apply and remove, is less annoying to the patient, is a good humidifier, fits practically all types of faces, does not build up excessive concentrations of carbon dioxide and may be used with positive pressure breathing if desired. Whenever the use of 100 per cent oxygen is essential for long periods, we recommend the use of this type mask. In view of the experiments of Hulpieu and Cole [28] it seems advisable to use a humidifying system in all types of oxygen administration.

SUMMARY AND CONCLUSIONS

1. One hundred per cent oxygen administered to a large group of normal men continuously for twenty-four hours produced substernal distress in 82 per cent. Vital capacity was usually decreased significantly. Signs of nose and throat irritation were common. Control subjects breathing room air through the same apparatus did not experience these symptoms.

2. Intermittence (up to fifteen minutes rest every three hours) did not decrease the incidence of the complaints.

3. Seventy-five per cent oxygen produced symptoms in only 55 per cent of the subjects; 50 per cent oxygen produced no symptoms during the twenty-four hour period. Since oxygen tents or catheters rarely produce alveolar oxygen concentrations higher than 50 per cent, these forms of administering oxygen are completely safe.

4. Breathing of 100 per cent oxygen at high altitudes (low total atmospheric pressures) does not produce symptoms, indicating that the symptoms are due to high oxygen tensions and not to elimination of nitrogen.

5. The use of 100 per cent oxygen for short periods is probably safe in all patients, but when oxygen must be given in excess of twelve hours the following rules should be followed: (*a*) the oxygen concentration should be reduced to 60 per cent unless this is insufficient to saturate the arterial blood, and (*b*) if 100 per cent oxygen must be administered a careful check should be made for the symptoms most likely to occur as a result of the high tension of oxygen.

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27. Armstrong, H. G.: The Toxicity of Oxygen at Decreased Barometric Pressures, Mil. Surgeon **83**: 148-151 (Aug.) 1938.

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THE CLINICAL MANIFESTATIONS OF POLIOMYELITIS

TREATMENT WITH NEOSTIGMINE AND THE KENNY METHOD

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During recent years much controversy has centered around the introduction of the Kenny [1] concept of poliomyelitis, which forms the rationale for the treatment which she advocates for the manifestations of this disease. Kenny describes three cardinal symptoms of poliomyelitis: muscle spasm, mental alienation and incoordination. She considers muscle spasm an early and important manifestation of the disease, present in all cases and underlying most of the disability associated with the disease. Mental alienation she describes as the mode whereby the function of a muscle opposed to a muscle in spasm is disturbed although no organic lesion exists in the motor pathways to the muscle. Rather the muscle is dissociated from, or "forgotten" by, the central nervous system. This she considers a more important cause of disability than paralysis due to destruction of motor cells in the anterior horn. Finally, Kenny describes incoordination as the dysrhythmic or inefficient contraction of muscles.

Recent investigation casts doubt on the validity of Kenny's concept. Moldaver [2] found that neuromuscular degeneration was present in all muscles considered "alienated." He felt that muscle spasm was a complex phenomenon produced by three factors: meningeal irritation, enhanced stretch reflexes of muscles opposed to muscles exhibiting neuromuscular degeneration, and irritative lesions of posterior ganglions and posterior horn cells. Schwartz and Bouman [3] were able to demonstrate action currents suggesting spasm in all muscles except those completely paralyzed. Clinical spasm was often not apparent, especially in weak muscles. Likewise, Watkins, Brazier and Schwab [4] found increased action potentials in the resting state in all muscles involved, whether in spasm or weak, especially after three months' recovery period. These observers felt that this was evidence of recoyery of innervation. In addition they noted simultaneous action currents to both of two opposing muscles in patients recovering from poliomyelitis, negating Sherrington's law of reciprocal innervation and possibly accounting for the incoordination described by Kenny.

Numerous investigators [5] have reported on the treatment of these manifestations by the Kenny method of hot foments and muscle reeducation, for the most part favorably. Kabat and Knapp [6] first described the use of neostigmine as a method of relaxing muscle spasm when used as an adjunct to hot foments and felt that return of motor power was enhanced and incoordination lessened.

It is our purpose in this paper to analyze the incidence and importance of the various manifestations of poliomyelitis on a purely clinical basis and to attempt to estimate the efficacy of neostigmine and hot foments combined with muscle reeducation in the relief of these phenomena.

CLINICAL MANIFESTATIONS

One hundred cases of poliomyelitis were observed in the Isolation Division of the San Francisco Hospital. These were all acute cases, the duration of illness on entry varying between one and thirty days. The treatment described was usually initiated within the first few days of hospitalization. Sixty-four males and thirty-six females, whose average age was 13.4 years, ranging in age from 3 months to 44 years, were studied.

Muscle Spasm.—All cases exhibited the phenomenon described by Kenny [1] as muscle spasm. This consisted primarily in a hyperirritable stretch reflex producing limitation of movement of parts. In addition, shortening of muscles at rest was often seen producing deformity. That this phenomenon of itself may produce disability is undoubted regardless of its role in production of muscle weakness, as evidenced by the shortened, fibrosed muscles seen in late or neglected cases. The muscles most commonly involved (table 1) were the posterior cervical, back and hamstring groups. These are the groups whose irritability to stretch stimulation is commonly attributed to meningeal irritation. That such is not the case in poliomyelitis is suggested by the persistence of these signs in some cases for many months after all possibility of meningeal irritation is passed, and also by the entire absence of spinal fluid abnormalities in a significant number of patients. In 93 early cases in which lumbar puncture was done, completely negative findings, usually on repeated taps, were obtained in 19, or 20.4 per cent. Seven of these cases showed muscle paralysis. In addition, 4 cases exhibited elevation of spinal fluid protein without pleocytosis. That the spasm was due primarily to enhanced stretch reflexes of muscles opposing muscles undergoing neuromuscular degeneration seemed doubtful, since the muscles opposing the muscles in spasm very frequently gave no clinical evidence of weakness, although no measurements of chronaxia were made.

Muscle Weakness.—This was observed in 48 (48.0 per cent) cases. It frequently existed in muscles whose opponents were not in spasm. However, more commonly the muscle opposing the weak muscle evidenced some degree of spasm. Quite commonly seen was the combination of spasm and weakness in a single muscle, whether or not opposed to a muscle in spasm. These weak muscles often developed atrophy while under treatment. The associated tendon reflexes were depressed or absent in 34.7 per cent of all cases. Hyperactive reflexes were seen in 17.9 per cent of cases, usually when the effector muscle exhibited spasm. Motor power generally returned gradually to weak

The neostigmine used in this study was furnished by Hoffmann-LaRoche, Inc.

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muscles during reeducation, although rarely almost instantaneous return of function was noted when spasm was relieved and reeducation attempted, suggesting absence of organic interruption of motor pathways.

Incoordination.—We likewise frequently observed incoordination. The most striking example of this misuse of muscles was repeatedly demonstrated in patients having weak quadriceps, who, on being asked to extend the knee, would visibly and palpably contract the hamstrings. This was exhibited less strikingly in other muscles.

TREATMENT

We attempted to study the effects of neostigmine and packs on muscle spasm in two ways. Realizing the tremendous variation in spontaneous recovery rate in poliomyelitis regardless of treatment, we first determined the ability of neostigmine to relax muscle spasm and increase motor power one hour after a hypodermic injection of neostigmine methylsulfate, control measurements having been made immediately before injection. Children under 6 years received 0.5 mg., those between 6 and 12 years 1.0 mg. and adults 1.5 mg. accompanied by 0.4 mg. and 0.6 mg. of atropine in the latter two age groups, as described by Kabat and Knapp.[6] Measurements of range of motion were made with a goniometer. Motor power was estimated only by clinical examination. From repeated measurements of patients under treatment we found that a small variation of less than 10 degrees in either direction in motion occurred frequently, so accordingly we did not consider relaxation significant in the one hour test unless it equaled or exceeded 10 degrees in at least one of the measured movements. Of 28 early cases in which the one hour test was done, 24 (85.7 per cent) showed a significant degree of muscle relaxation within one hour. In individual cases there was often a startling difference in amount of relaxation of various muscle groups, some showing definite improvement and others changing little or not at all. A large number of cases showed a partial or, rarely, complete regression to previous range of motion in spite of continued treatment with packs and neostigmine, with subsequent more gradual improvement. That this was not entirely due to progressive involvement by the disease was suggested by the fact that regression was also observed in some cases first tested over two weeks after onset. Occasionally the relaxation of spasm was dramatic, and in 1 instance of a patient exhibiting moderate spasm of the posterior neck, back and hamstring groups almost complete motion was restored in one hour. In 2 instances of quadriceps muscles exhibiting motor weakness, definite return of motor power was noted during the test period.

Secondly, an attempt was made to compare the effectiveness of neostigmine or hot foments singly or in combination in a selected group of cases without paralysis and having spasm largely limited to the posterior cervical, back and hamstring groups. Thirty-one such cases were studied. Neostigmine was administered subcutaneously every other day in similar dosage to that used in the one hour test. In addition most patients also received neostigmine bromide by mouth thrice daily. Children under 6 years received 15 mg. three times daily, those from 6 to 12 years received 30 mg. thrice daily and adults received 45 mg. on a similar schedule. When parasympathomimetic side effects such as nausea, diarrhea or urgency occurred, increased atropinization almost always promptly relieved them. No serious toxic effects of neostigmine were noted. Measurements of range of motion were made at frequent intervals and comparison was made of the average duration of treatment before complete recovery. The results (table 2) we feel are misleading and illustrate the fact that no statement should be made on the long term results of any treatment of poliomyelitis without a very large controlled series. We suggest a cooperative clinical group for this purpose in the future.

With the exception of 2 patients who had prompt improvement in motor power during the one hour test, muscle power exhibited extreme variation in rate of return. In all, 45 patients were treated with neostigmine. Except in 4 instances these patients also received hot foments. The variation in duration of hospital stay and amount of residual impairment in those receiving packs alone or combined with neostigmine was maximal and would allow no accurate estimation of the relative efficacy of the two modes of treatment.

Certain statements may be made, however, concerning end results of the Kenny treatment with and without neostigmine. Thirty one (31 per cent) of our series have residual muscle weakness. (Two have facial weakness only.) Of this group only 1 has a contracture, not the fault of therapy but due to lack of cooperation. All patients are able to use what muscle power remains with remarkable efficiency. All are able to walk without braces. Fourteen of this group were treated with packs alone, 17 with packs and neostigmine.

TABLE 1.—*Distribution of Muscle Spasm in 100 Patients*

Muscle group	Patients with Spasm, %
Posterior cervical	99.0
Back	100.0
Hamstring	85.0
Quadriceps femoris	30.0
Adductor magnus	28.0
Calf	13.0
Pectoral	9.0
Other	21.0

TABLE 2.—*Treatment of Selected Patients, Exhibiting Only Spasm of Neck, Back and Hamstring Groups*

Treatment	Number of Patients	Average Days Before Recovery	Range of Days Before Recovery
Packs only	17	35.6	10 to 77
Neostigmine only	4	21.8	9 to 36
Packs and neostigmine	10	54.7	7 to 110

CONCLUSIONS

1. Muscle spasm is of uniform occurrence in early poliomyelitis and is of great diagnostic value.
2. Muscle spasm does not appear to be due primarily to meningeal irritation. Spinal fluid pleocytosis is frequently absent.
3. Muscle spasm is in itself disabling, but its role in the etiology of muscle weakness is unproved.
4. Neostigmine methylsulfate will relax the muscle spasm of poliomyelitis at least temporarily.
5. The value of continued medication with neostigmine, orally or subcutaneously, requires further proof, but its further trial under controlled circumstances is definitely warranted.
6. The Kenny treatment with or without neostigmine is an effective method of preventing contracture and deformity.
7. Our study gave no proof nor disproof that either neostigmine or Kenny packs reduce the incidence of paralysis.

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THE VALUE OF NEOSTIGMINE IN ACUTE ANTERIOR POLIOMYELITIS

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Recent developments in the therapy of poliomyelitis have emphasized the element of spasm of the involved muscles and the desirability of treating this spasticity. In the Kenny method, hot foments are used for this purpose. Kabat and Knapp [1] have reported favorably on the use of neostigmine to control the muscle spasm. They have attacked the problem from the point of view of the disturbed neurophysiology described by Watkins, Brazier and Schwab [2] and by Moldaver.[3]

Since many of the patients studied by Kabat and Knapp were in the chronic stage of poliomyelitis, we have been interested in studying the relaxing effect of neostigmine on the acute stage of the disease. Thus far we have used neostigmine in 24 cases in which the age ranged from 3 to 55 years. The patients had been ill with poliomyelitis for an average of only 5.5 days, with the duratioin of the disease before admission to the hospital ranging from one to twenty-one days. The average duration of neostigmine therapy for this group was 14.6 days, while the control cases were studied for an average of 10.8 days.

PROCEDURE

On admission to the hospital all patients were examined thoroughly, spinal taps were performed, and the diagnosis of acute anterior poliomyelitis was thus confirmed. The muscles most commonly found to be in spasm were the gluteals, hamstrings, extensors of the neck and the sacrospinalis groups, but only the hamstring and gluteal muscles have been studied in relation to relaxation in this series.

In order to evaluate the effectiveness of therapy, specific measurements were made of the amount of spasm in these muscles. The degree of spasm in the hamstring muscles was determined by measuring the angle formed at the popliteal fossa between the leg and the thigh, with the thigh flexed at a right angle to the plane of the body. The amount of gluteal spasm was determined by measuring, with the knee extended, the angle formed between the thigh and the support on which the body rested. The patient's subjective sensation of pain was used as the limit of the range of passive motion possible in the affected muscle.

After the admission work-up of the patient was completed, the following regimen was instituted:

At 8 a. m. the angles related to the gluteal or hamstring spasm were measured. Immediately thereafter the patients were given neostigmine methylsulfate. Atropine sulfate 1/100 to 1/200 grain (0.65 to 0.32 mg.) was administered hypodermically at the same time in an attempt to control parasympathetic reactions.

At 9 a. m. the angles were remeasured and the number of degrees of increase due to muscular relaxation were thus determined. Hot fomentations were then applied continuously to the involved muscles according to the Kenny technic until 3 p. m., when they were stopped and the angles again measured.

Two methods of administration of neostigmine were used in our study:

1. Thirteen of the patients received single daily subcutaneous injections of 1:2,000 neostigmine, the usual dose being 1.0 mg.

2. Six of these patients were changed to oral administration of the drug after four to thirteen days, and 11 additional patients received the oral neostigmine from the beginning of their therapy. The oral neostigmine was given twice daily, 30 mg. being given at 8 a. m., with 15 mg. at 6 p. m.

Six patients served as partial controls. Unfortunately some of these had received neostigmine for a portion of their therapeutic period. Three of these were treated with neostigmine for six, seven and eleven days respectively before it was discontinued and relaxation studied without its use. One patient was studied without neostigmine for the first nine days of hospitalization and was then treated with the drug for three days. A fifth patient recived 1.0 mg. of neostigmine on his second and third hospital days in an attempt to relieve bladder sphincter paresis. Only 1 patient received no neostigmine at all. The control patients received the continuous hot foments comparably to the other patients for six to seven hours each day, and the angles related to the muscles in spasm were measured at 8 a. m. and 3 p. m.

RESULTS

Within the first hour after neostigmine administration, several of the patients had drug reactions consisting of muscle spasm or twitching, abdominal sensory illusions, substernal pain, nausea, vertigo or emotional disturbances. These reactions, however, were not severe and the patients rarely complained unless questioned regarding the effects of the drug. In no case was it necessary to discontinue the neostigmine.

The details of the effects of the neostigmine therapy on the passive motion of spastic muscles are given in the accompanying table. Results are grouped according to the amount of neostigmine given and the method of its administration. Listed in the table are the average daily amounts of relaxation obtained at 9 a. m., one hour after the neostigmine administration and at 3 p. m., six hours later, after the continuous applications of the hot fomentations. These results are recorded separately for each muscle group measured, i. e. right or left hamstring or gluteal spasm, but each figure represents the average of several days of individual measurements. Also included in the table are the total changes in the degree of spasticity for each muscle group during the entire therapeutic period.

It is to be noted that there was not a constant relaxation of muscle spasm for any form of therapy or period of time. Some cases showed decided improvement, while other cases exhibited either slight or no improvement, and some even showed an increase in the amount of spasm. Often those who relaxed well during the day would have enough return of spasm at night so that the total change for the entire therapeutic period was less than might have been anticipated on the basis of one day's performance.

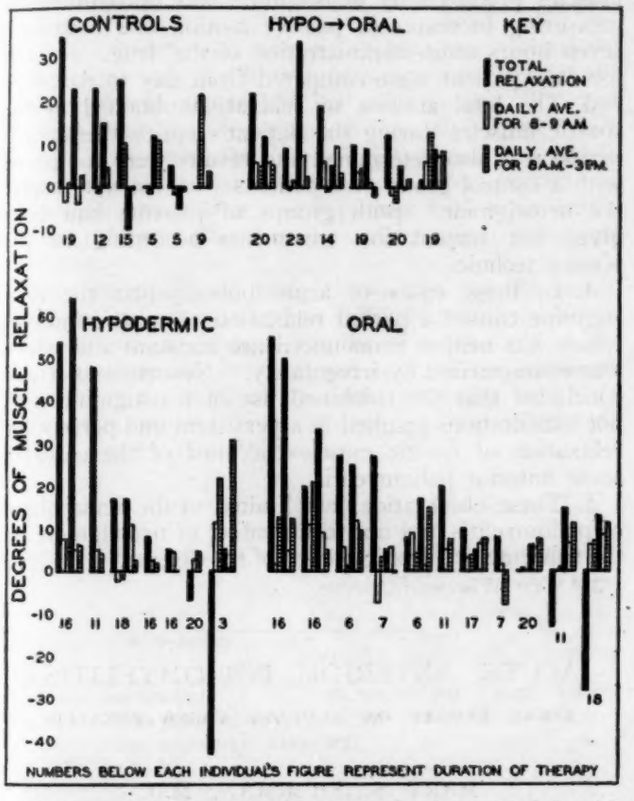
From the South View Isolation Hospital of the Milwaukee Health Department and the Department of Internal Medicine, Marquette University School of Medicine.

1. Kabat, H., and Knapp, M. E.: The Use of Prostigmine in the Treatment of Poliomyelitis, J. A. M. A. **122**: 989-995 (Aug. 7) 1943.

2. Watkins, A. L.; Brazier, M. A. B., and Schwab, R. S.: Concepts of Muscle Dysfunction in Poliomyelitis, Based on Electromyographic Studies, J. A. M. A. **123**: 188-192 (Sept. 25) 1943.

3. Moldaver, J.: Physiopathologic Aspect of the Disorders of Muscles in Infantile Paralysis: Preliminary Report, J. A. M. A. **123**: 74-77 (Sept. 11) 1943.

In view of this extreme variability, the use of averages is of questionable value; but we have presented this form of summary as a further aid for interpreting the results. The average relaxation of all patients one hour after giving the neostigmine was found to be 3.4 degrees, with a greatest relaxation for



Effect of neostigmine on muscle spasm: relaxation reported for right and left hamstrings or gluteal muscles for each patient.

any one muscle group for this hour of 39 degrees. The average relaxation for the day in the patients receiving neostigmine was 3.5 degrees, a figure which is comparable to the reduction of spasm which occurred during the first hour. One might conclude, therefore, that the neostigmine gave more relaxation than did the hot foments which were used later throughout the day or, on the other hand, that the effect of neostigmine was produced early rather than over a prolonged period of time. It must be remembered, however, that there is a natural impairment of mobility of joints following a night's sleep and that there would automatically be some improvement in passive motion during the 8 a. m. to 9 a. m. hour, regardless of whether or not any therapy had been given.

In the control series the average daily relaxation was 5.9 degrees, which is a better response than that for the neostigmine group. This must be interpreted as due to individual variability and an inadequate number of cases, since, if this relaxation had been due to hot fomentations alone, the results of the two series should have been comparable.

The average total amount of improvement in the patients receiving neostigmine from the beginning to the end of therapy was found to be 14.7 degrees. These overall results for neostigmine are somewhat higher than those of the control group, which had an average total increase of 10.3 degrees of relaxation. It must be pointed out, however, that the control patients were studied for a shorter period of time.

The variability of the effects of neostigmine is perhaps appreciated better from the graphic presentation of the data in the chart. The results have been plotted for the separate muscle groups, right and left, of each individual patient and show the total amount of relaxation in these muscles over the entire therapeutic period as well as the average changes for the first hour after administration of the neostigmine and for the whole day. It will be observed that the black columns for total relaxation vary considerably in height between individuals and have no relationship with the white or barred columns, which represent the average changes during the day.

Several factors must be considered in any attempt to explain the variability in our data. In addition to an inadequate number of cases and the resultant domination of individual differences, part of the apparent conflict in our data may have been due to the subjective element unavoidable with the angle measurements. In spite of our efforts to determine these angles accurately, the subjective element was important since the patients tended to show resistance to passive motion

Amount of Relaxation Produced in Spastic Muscles by Means of Neostigmine and Hot Fomentations

(Relaxation was determined daily by measuring the angle of passive motion obtainable with the spastic muscles)

Age	Days Since Onset	Period of Therapy	Neostigmine Dose	Neostigmine Adm.	Average Daily Change in Angle: Right 8-9	Right 8-3	Left 8-9	Left 8-3	Total Change During Therapy: Right	Left
8	3	19	0	.....	—3.3	1.0	—3.6	2.8	35	23
15†	7	12	0	.....		—1.2		4.6	23	15
15	3	15	0	.....		10.2		—0.3	25	—10
41†	10	5	0	.....		—1.5		11.0	0	12
21†	13	5	0	.....		—1.7		—1.0	5	—5
13†	8	9	0	.....		21.6		3.7	—1	—2
								Average	10.3	
12*	4	16	1	Hypo.	7.5	7.5	4.9	6.0	54	64
7*	8	11	1	Hypo.	...	...	4.9	4.0	..	48
12*	6	18	1	Hypo.	—2.2	—2.0	11.1	2.3	17	17
16*	0	16	1	Hypo.	—2.4	—1.7	...	...	8	..
39*	4	16	1	Hypo.	...	...	4.3	0.0	..	5
15*	4	20	1.5	Hypo.	...	...	2.4	4.5	..	—7
13†	19	3	1	Hypo.	11.4	21.6	0.2	30.7	—43	5
								Average	16.8	
32*	8	20	(1	(Hypo.	5.8	4.9	5.8	5.3	22	12
21*	5	23	or	or	—0.4	1.7	7.3	2.3	9	34
17	15	14	45)	Oral)	6.1	—1.2	9.7	3.2	19	5
15	5	19	.....		3.3	4.4	1.0	—2.3	10	9
13	3	20	.....		—2.0	—3.4	—0.2	2.0	12	5
10	4	19	.....		6.3	13.0	7.5	8.5	2	9
								Average	12.3	
3	5	16	30	Oral	1.3	12.7	4.7	12.4	55	50
7	8	16	45	Oral	10.8	20.8	9.0	4.7	20	33
7	4	6	45	Oral	5.5	1.0	12.0	9.6	27	25
41†	3	7	45	Oral	—7.2	3.0	5.5	—0.4	27	5
15†	1	6	45	Oral	9.0	4.0	1.0	15.0	8	17
18	7	11	45	Oral	5.0	7.5	.....	.....	20	..
55	8	17	45	Oral	3.0	3.8	6.6	7.7	10	5
29	21	7	45	Oral	1.5	—8.0	.....	.....	8	..
15	4	20	45	Oral	0.6	0.0	5.5	7.3	0	6
21†	2	11	45	Oral	0.0	0.8	6.7	11.2	—13	15
7	1	18	45	Oral	6.1	7.0	8.5	11.4	—28	13
								Average	15.2	

* Measurements on these patients are for gluteal spasm. All other measurements are for hamstring spasm.

† These patients were studied both for control and for neostigmine periods.

by either voluntary or involuntary contraction of muscles during the examination, and the point at which passive motion would produce pain was not constant. Immediate repetition of the measurement occasionally gave an entirely different angle, which sometimes differed by as much as 100 per cent from the first measurement.

Another factor which may have influenced the results must also be considered. The duration of effect of neostigmine, as well as the difference in response due to mode of administration, need more careful study. Goodman and Gilman [4] state that hypodermic injections are believed to have an influence of at least six hours' duration, while oral neostigmine exerts its effect over a longer period.

The following case is presented briefly to show that there are inconsistent and irregular periods of relaxation of affected muscles in acute poliomyelitis which can appear at any time and disappear within a few hours. This further illustrates the fallacy of attempting to interpret accurately the relaxation of the spastic muscles.

L. A., a white youth aged 15 years, entered the hospital on Oct. 17, 1943, four days after the onset of the disease. His cerebrospinal fluid findings substantiated a diagnosis of acute anterior poliomyelitis. His initial muscle involvement was spasm of the neck extensors, sacrospinalis group and hamstrings, paralysis of the right quadriceps and left iliopsoas, and paresis of muscles for micturition. He received 1.0 mg. of neostigmine on October 17 and 1.0 mg. on the 18th. Representative angle readings for his left and right hamstrings were, on the 18th, 1 and 22 relaxation, respectively, for the day, on the 28th, 5 and 15 relaxation and on Jan. 30, 1944 1 and 0 relaxation.

The effects of neostigmine were studied on 4 cases of bulbar poliomyelitis also. All 4 of these cases were primarily bulbar in type, i. e. not of the ascending form but with the paralysis confined chiefly to the pharynx, larynx and palate, with loss of cough reflexes. Neostigmine injections of 1.0 to 1.5 mg. daily were given to these 4 patients. In addition, hot packs were applied to their necks, fluids were administered to combat dehydration, and scarlet fever convalescent serum and sulfonamides were used to combat pneumonitis. Beds were elevated at the foot to promote drainage of nasal and pharyngeal secretions. In spite of these therapeutic efforts, 3 of the 4 patients died, and no benefit whatever was noted from the neostigmine.

It will thus be seen that in our series of cases of acute poliomyelitis no pronounced or even consistent relaxation was produced by the neostigmine therapy. This was disappointing to us, since we felt that its use was based on sound pathophysiologic principles and also since Kabat and Knapp's work had been encouraging. It is probable that our results differed from those of Kabat and Knapp because all of our cases were acute in contrast to a predominance of chronic cases in their series. In spite of the discrepancies in our data, we wish to advance the following tentative conclusions, since we believe them to be justified on the basis of our observations:

1. Neostigmine produces a partial relaxation of the spastic muscles in a majority of cases of acute anterior poliomyelitis. The relaxation obtained with neostigmine is neither dramatic nor constant, is characterized by irregularity in response and is followed by a gradual return of spasm, which frequently reaches its initial level within twenty-four hours.

2. The combined use of neostigmine and hot foments in the treatment of acute anterior poliomyelitis results, in most cases, in a perceptible and persistent relaxation of spastic muscles, which is evident after several days of therapy and its further use is warranted.

3. Neostigmine appears to be of little value in bulbar poliomyelitis.

4. Goodman, L., and Gilman, A.: The Pharmacologic Basis of Therapeutics, New York, Macmillan Company, 1941, chapter 21, pp. 378-388.

SUMMARY

1. The effect of neostigmine on spastic muscles has been studied by the use of subcutaneous and oral doses of the drug in 24 patients with acute anterior poliomyelitis.

2. The degree of daily relaxation of the involved muscles produced by neostigmine was determined by measuring increases in passive motion one hour and seven hours after administration of the drug. Results for each patient were compared from day to day.

3. The total amount of relaxation obtained in the spastic muscles during the patient's entire therapeutic period was also determined and results were compared with a control group of 6 patients who did not receive the neostigmine. Both groups of patients had been given hot fomentation treatments according to the Kenny technic.

4. In these cases of acute poliomyelitis the neostigmine caused a partial relaxation of spastic muscles which was neither pronounced nor constant and which was characterized by irregularity. Nevertheless it was concluded that the combined use of neostigmine with hot fomentations resulted in a persistent and perceptible relaxation of spastic muscles in most of the cases of acute anterior poliomyelitis.

5. These observations are limited to the acute phase of poliomyelitis and not to the effect of neostigmine on the subacute or chronic phases of the disease.

324 East Wisconsin Avenue.

ACUTE ANTERIOR POLIOMYELITIS

FINAL REPORT ON SEVENTY CASES TREATED IN 1943

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In May of 1944 a preliminary report was made on the status of 70 patients six months after they had had acute anterior poliomyelitis during the Chicago epidemic of 1943.[1] These patients had had only general supportive therapy during the acute phase of the disease. The survey revealed that 10 per cent had enough residual weakness to require braces or future surgery, 72.8 per cent had no residual weakness or such slight weakness that it was barely detectable, and 8.6 per cent had functionally significant weakness which did not require further therapy and which did not constitute a handicap to a normal life. There were 8.6 per cent deaths.

The 64 survivors of this group have been followed carefully at short intervals, and it is now possible to present a report of their condition eighteen months after the acute disease.

No one of the 13 nonparalytic patients has developed any sign of weakness, spasm, stiffness or deformity. Seven patients who had had paresis but who had recovered completely at the end of six months have remained normal. Since then 19 other patients have recovered sufficiently so that no weakness is now demonstrable. Of this total of 26, 20 had originally moderate weakness and 6 (all of whom had severe bulbar involvement) had profound paresis. There are 12 others who have improved decidedly but who have remaining detectable though functionally insignificant

From the Department of Surgery, Division of Orthopedic Surgery, University of Chicago.

1. Sherman, Mary S.: The Natural Course of Poliomyelitis: A Report of 70 Cases, J. A. M. A. **125**: 99-102 (May 13) 1944.

weaknesses. Two of these patients have very mild, well compensated and nonprogressive scoliosis which does not require treatment. All 6 patients who were listed as having functionally significant weakness which did not require further treatment have made sufficient recovery to be classed at present with those whose weaknesses are insignificant even though 2 of them limp slightly.

The 7 patients who after six months were considered to be candidates for braces or surgery are essentially unchanged and are still in the same group. Two are wearing long leg braces and 2 have flail arms which show no recovery, but only 1 is extensively handicapped. One arm will be restored to good function by a shoulder arthrodesis and 1 patient with a weak foot will be returned almost to normal by a foot stabilizing operation.

The accompanying table shows the comparison of results at six months and at eighteen months. It will be seen that at eighteen months 81.4 per cent of the total initial group or 89.1 per cent of the survivors have either no residual or slight weakness, and 10.9 per cent of the survivors have a handicap which will require braces or surgery.

Status of Patients Six Months and Eighteen Months After Illness

	Total Group		Survivors Only	
	6 Mos.	18 Mos.	6 Mos.	18 Mos.
1. No detectable weakness at any time	13 (18.5%)	13 (18.5%)	13 (20.3%)	13 (20.3%)
2. Those who had paresis but are not now handicapped	38 (54.3%)	44 (62.9%)	38 (59.4%)	44 (68.8%)
a. No detectable weakness now....	7	26	7	26
b. Functionally insignificant weakness	31	18	31	18
3. Functionally significant weakness which requires no further therapy	6 (8.6%)	0	6 (9.4%)	0
4. Severe weakness requiring braces or surgery	7 (10%)	7 (10%)	7 (10.9%)	7 (10.9%)
5. Deaths (4 bulbars, 2 spinal).....	6 (8.6%)	6 (8.6%)		

COMMENT

No patient has regressed. This is probably attributable not so much to the degree of recovery as to the detailed early evaluation of the patient's muscular state.

Major improvements, as was expected, have occurred, without exception, in those patients who had not been completely paralyzed. In all patients but 1 the subsequent course has agreed with the prognosis made when the acute phase had subsided. This 1 patient was expected to be grossly handicapped but has made a spectacular recovery.

The later course of these patients supports further the recently ignored fact that the amount of ultimate recovery depends primarily on the extent of initial involvement of the central nervous system and not on the type of treatment.

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Medical Institutions in Japan.—In 1937 there were nineteen government controlled medical schools and nine private medical schools. In the same year there were eight dental colleges. Diagnostic, research and biologic laboratories are almost exclusively government controlled or operated. There are several charitable organizations in Japan that are interested in public health, most notable of which is the Red Cross.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

OSTEITIS CONDENSANS ILII

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AND
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Osteitis condensans ilii is a term applied to the alteration of the bony architecture of the iliac bone adjacent to the sacroiliac joint. The condition is characterized by condensation of the involved bone without involvement of the joint space or adjacent sacrum. During the year 1943, 23 patients presenting these changes were seen in the clinic. Since the condition has been described infrequently, a study of the clinical manifestations was undertaken to determine whether a clinical syndrome accompanied or produced this roentgenographic change.

A review of the literature relative to osteitis condensans ilii revealed that the first article appeared in 1926, at which time Sicard, Gally and Haguenau [1] reported 5 cases, describing accurately the roentgenograms. They stated that they did not know the etiology. In 1928 Bársony and Polgár [2] in an article on the condition were not sure that it was a clinical syndrome but described the changes in the iliac bone quite satisfactorily as a sclerosing type of bone lesion. In 1932 Berent [3] in a report stated that it was his belief that the disease was the result of pregnancy and that he had seen it only in women following childbirth. He presented 3 cases, all with some injury prior to or during delivery as a result of (1) premature rupture, (2) the use of high forceps and (3) acute pain during delivery. This hypothesis has been partially disproved, as the condition has occasionally been diagnosed in the male patient.[4] Berent's experience has been similar to ours in that all patients have been women, but not all gave a history of pregnancy.

In 1936 Rendich and Shapiro [4] carefully reviewed the literature and reported their cases. In 1 case fusion of the sacroiliac joint was carried out, at which time a biopsy of the involved bone was taken and the report of Dr. William Hala [4] was as follows: "There is marked condensation of the osseous tissue with obliteration of the evident former lacunae. There appear to be no osteolytic or osteoclastic changes in the bone and neither is there any evidence of overactivity of the osteoclasts or osteoblasts. In fact, these cells are more or less conspicuous by their absence. The marrow spaces contain an unusual number of myocytic and plasma types of cells. The significance of the plasma cells is undetermined. In general, the lesion appears to be of an osteitis condensans type. It is apparently independent of any inflammatory or other etiology so far as can be ascertained from the histology of the specimen. Occasionally, in the condensed bone there appear to be depositions of lime salts which occur more or less in irregular linear areas, but more or less parallel to the lamellae of the bone." Rendich and Shapiro did not attempt to describe the condition as a clinical entity but simply stated that the symptoms were vague and the physical findings scant and not informative.

From the Department of Radiology (Dr. Hare) and the Department of Bone and Joint Surgery (Dr. Haggart), the Lahey Clinic.

Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Sicard, J. A.; Gally, L., and Haguenau, J.: Ostéites condensantes, à étiologie inconnue, J. de radiol. et d'électrol. **10**: 503-507 (Nov.) 1926.
2. Bársony, T., and Polgár, F.: Ostitis condensans ilii—ein bisher nicht beschriebenes Krankheitsbild, Fortschr. a. d. Geb. d. Röntgenstrahlen **37**: 663-669 (May) 1928.
3. Berent, Fritz: Beiträge zur Pathologie der Kreuzdarmbeinfugen, Arch. f. orthop. u. Unfall-Chir. **32**: 642-646, 1933.
4. Rendich, R. A., and Shapiro, A. V.: Osteitis Condensans Ilii, J. Bone & Joint Surg. **18**: 899-908 (Oct.) 1936.

SYMPTOMATOLOGY AND PHYSICAL FINDINGS

Recurrent attacks of chronic low back and pelvic pain were the most common complaints. In most instances the pain was more severe in one sacroiliac than in the other. In 10 cases pain remained localized, whereas in 13 cases it extended down one thigh. Attacks of pain in most instances were brought on by bending forward or by lifting. These attacks lasted from two weeks to several months, during which time the patient was incapacitated, and with each subsequent attack the pain became more severe.

In 8 of the 23 cases, and probably in more although the history does not record it, the onset of symptoms was noted just prior to or following delivery. In no instance was there a history of severe trauma. The history of onset in the other cases was vague. In 2 cases the onset followed minor falls. Two other patients noted their first pain at the onset of the menstrual period. All patients were women within the child-bearing age, the average age being 30 years. The oldest patient was 38, the youngest 23 years of age.

In our group the duration of symptoms before diagnosis varied from seven months to fifteen years; the average was three years. Obesity was not a factor. The weight varied from 104 to 211 pounds (47 to 96 Kg.); the average weight was 146 pounds (66 Kg.).

The physical findings have not been significant with the exception that all patients presented constitutionally inadequate musculature and in only 4 cases was a positive straight leg test elicited. In these 4 cases a diagnosis of herniated disk was considered, and 1 patient was operated on for herniated disk without relief of symptoms. Since operation the symptoms have become progressively worse over a period of two years.

The sacroiliac test was positive in all cases, but, since the value of this test is questionable, no conclusion may be drawn from it at present.

LABORATORY DATA

In 2 instances the blood sedimentation rate was increased above normal. In 1 case only a transitory rise was noted, with subsequent return to normal. All other laboratory tests gave consistently negative results.

DIFFERENTIAL DIAGNOSIS

The most important single differential diagnosis to be made is to distinguish osteitis condensans ilii from arthritides, especially the Marie Strümpell type, which is similar in appearance roentgenographically and represents the category in which these patients have in the past been placed. In both diseases the pain may grow progressively worse, but in osteitis condensans ilii the disease, as far as we have observed it, has remained localized to the affected ilium, while in nearly all cases of arthritis the disease has slowly progressed to involve the entire spine. Rheumatoid arthritis of the Marie-Strümpell type occurs predominantly in the male, while osteitis condensans ilii has in our experience been present only in the female. In rheumatoid arthritis the sedimentation rate is consistently and persistently elevated, which has not been true in our present series of cases of osteitis condensans ilii.

Summary of Twenty-Three Cases

Case No.	Age, Years	Onset	Radiation	Straight Leg Test	Duration, Years	Sedimentation Rate	Weight, Pounds	Comment
1	38	Delivery	0	0	5	16	104	
2	35	Delivery	0	0	4	2	110	
3	32	Delivery	+	?	2	51-16	195	
4	29	No trauma	+	?	3	50	130	
5	39	No trauma	+	0	2	11	121	
6	30	Delivery	+	0	15	6	143	
7	33	No trauma	+	0	15	76	133	Rheumatic arthritis
8	24	1 week delivery	+	0	2	26	124	
9	35	Fell	0	0	4	..	142	
10	31	Delivery	0	Slight + 0	7½	31	107	
11	39	Delivery	+	0	1	..	130	
12	31	Pregnant	+	+ right and left	3	..	190	
13	38	Fell	+	0	12	18	171	
14	26	0	+	+ left	3	63	118	
15	23	0	+	+	2	..	...	
16	36	?	0	0	?	32	211	
17	26	.....	..	..	..	..	...	Rheumatic arthritis
18	29	? worse with period	+	?	3	..	...	
19	28	.....	..	..	..	..	...	
20	28	? worse with period	0	..	8	15	118	
21	30	.....	+ Bilateral	0	7 months	..	118	
22	26	.....	..	..	..	..	...	
23	26	.....	..	..	..	..	...	
Average	31	.....	..	Positive in 4 cases	3 years	Elevated in 2 cases, 20 normal	138	

Pain in low back and pelvis..... 23 cases
Radicular pain..... 13 cases

ETIOLOGY

The cause of this disease is unknown. One theory presented previously is that following trauma, usually of childbirth, there is interference of blood supply to the inferior margin of the ilium adjacent to the inferior margin of the sacroiliac. The blood supply to this particular portion of the ilium is not well described, but in the roentgenogram the nutrient arteries are seen to lie lateral to the bone usually involved.

TREATMENT

Conservative treatment consisting of rest, baking and massage and a supportive belt is usually successful in relieving the periodic attacks of pain. In some instances, however, the disease is incapacitating. Bending will bring on an attack which will require days to weeks of bed rest and care to alleviate. In these instances and in those cases in which relief is not obtained by conservative measures, operative fusion of the sacroiliac joint should be considered.

THE ROENTGENOGRAM

Routine roentgenograms of the lumbosacral spine do not show the sacroiliac articulations in their entirety, and because this condition appears most frequently in the female in whom the sacrum tends to be of the

horizontal type, special views of the sacroiliac articulations are essential before correct interpretation can be made. We routinely take a 45 degree angle view of the sacroiliac joint in all cases in which the symptoms are referable to the lumbar spine in order that we may see the sacroiliac articulations and the sacral foramens in their entirety. The 45 degree angle view has been well described on numerous occasions and need not be described further except to say that it is an essential exposure in order to make a correct diagnosis of disease of the sacroiliac articulations.

In a study of the sacroiliac articulations in cases of osteitis condensans ilii it is well to remember that the auricular portion of the ilium extends behind the anterior edge of the sacroiliac joint, so that the portion of the ilium which lies behind the sacrum may give the appearance of disease of the sacrum and even of the joint. As the name implies, osteitis condensans ilii is characterized by dense sclerotic bone with obliteration of the trabeculae of the auricular portion of the ilium and the portion of the ilium adjacent to the sacroiliac articulation. The line between normal and abnormal bone is distinct. The abnormal bone is similar to that seen with Garré's sclerosing osteitis and appears on the roentgenogram as if this portion of bone were underexposed. The disease in all of our cases was symmetrical, although in some of the cases previously reported it was limited to one ilium and there are reported cases of the disease in the low lumbar vertebrae, in the os calcis and in the femurs. Perhaps the disease seen in other bones may have been the result of a mono-osteitic type of Paget's disease or of embolic manifestations.

The important finding on the roentgenogram, then, consists of dense bone involving the auricular portion of the ilium and the portion of the ilium adjacent to the sacroiliac articulation. The degree of involvement may vary in individual cases, but in all cases the articulation remains intact and the sacrum is not involved, as shown in the accompanying table.

REPORT OF CASES

CASE 1.—A woman aged 38 entered the clinic on April 23, 1943 complaining of pain in the lower part of the back and in the left thigh of twelve years' duration. About twelve years before entry she fell backward, stretching her left leg. This was followed immediately by pain in the left thigh. The pain disappeared but soon episodes of pain in the low back began, with extension down the left thigh and up between the shoulder blades, accompanied by pain extending down to the left foot posteriorly, not aggravated on coughing or sneezing. The pain was severe at night, and sleeping on a hard bed gave no relief. Two years before she entered the clinic the coccyx had been removed because of pain. The pain had persisted following operation and had been severe enough to keep the patient from working. She stated that if she bent over to pick up something the leg became so sore that she was unable to walk for a few days. She had had one child prior to the onset of pain.

Physical examination revealed that the patient was obese and of chunky build. The back motions were free of pain. The straight leg raising test gave negative results bilaterally. The ankle and knee jerks were sluggish. Over all of the back and especially over the iliac crest there was tenderness superficially, worse on pinching a mass of subcutaneous fat. The tenderness was present also on the lateral side of the left thigh. On direct pressure over the left sciatic notch there was tenderness, but this was present also on pinching the fat mass and did not occur on pressure farther down the course of the sciatic nerve. There was subcutaneous tenderness over the back up to the shoulders. The patient had gained 30 pounds (13.6 Kg.) in fourteen months.

Laboratory examination revealed hemoglobin 101 per cent, red blood cell count 4,820,000, white blood cell count 7,700, differential count normal. The Hinton test gave negative results. The sedimentation rate was 18 mm. per hour.

A diagnosis was made of lumbosacral arthritis and sclerosing osteitis of the ilia, and the patient was advised regarding weight reduction, physical therapy and muscle training.

Roentgenograms taken of the lumbosacral spine showed asymmetrical facets of the lumbosacral region, with some narrowing of the intervertebral space of the lumbosacral junction with reaction on the right (fig. 1). There was increased density around both sacroiliac joints on the iliac side, more pronounced on the right, as a result of sclerosing osteitis. The coccyx had been removed. The roentgenologist's interpretation was lumbosacral arthritis with sclerosing osteitis of the ilia.

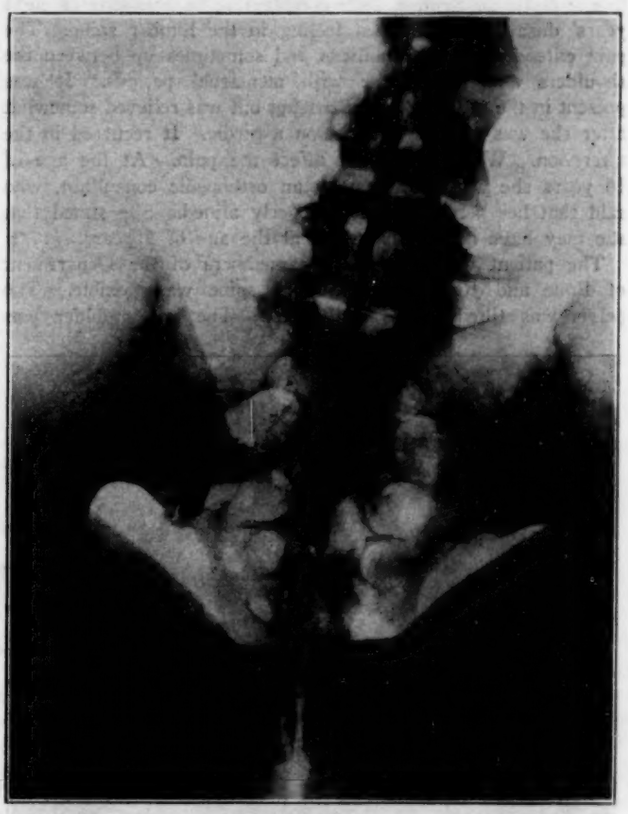

Fig. 1.—Osteitis of lower third of the ilium adjacent to the sacroiliac joint, with slight involvement of the auricular portion. The sacroiliac joint appears normal. The lesion is symmetrical.

CASE 2.—A woman aged 31 entered the clinic on Nov. 8, 1943 complaining of backache of seven years' duration and vaginal discharge of two years' duration. About six months following the birth of her first child, seven and a half years before, she first noticed back pain. The difficulty was not associated with lifting or moving. The pain was relieved by wearing a girdle throughout the day. She had a feeling as though her "insides were going to fall out," a sensation that "something would come out of her vagina during evacuation." Frequency and urgency of urination were present. Two and a half years before coming to the clinic, and about six months following the birth of the second child, she noted a vaginal discharge.

Laboratory examination revealed hemoglobin 104 per cent, red blood cell count 5,000,000, white blood cell count 10,000, differential count normal. The Hinton test gave negative results. The sedimentation was 8 mm. She weighed 107 pounds (48.5 Kg.).

The patient was seen by members of the Department of Bone and Joint Surgery, who made the following note: The

patient described a low grade backache localized to the left sacroiliac area with occasional reference to the left gluteal area and left sciatic notch. Pain was present much of the time. There was no sciatic pain. The spine motions were normal. There was tenderness over the left sacroiliac region, the left gluteal region and at the left iliolumbar ligament. The sacroiliac test gave negative results. Reflexes were normal. There were no sensory changes.

Roentgenographic examination was made (fig. 2) and the roentgenologist's report was as follows: "Anteroposterior and lateral views of the lumbosacral spine show condensing osteitis of both iliac bones. The process is symmetrical. The sacrum appears to be normal. The joint spaces are normal. Interpretation: Condensing osteitis of the ilia."

The patient was advised to continue the use of the back brace and to have physical therapy.

Case 3.—A woman aged 28, mother of 1 child, first came to the clinic on Sept. 8, 1939 complaining of backache of eight years' duration and a tired feeling in the lumbar spine. The pain extended to the umbilicus and sometimes up between the shoulders and was worse with menstrual periods. It was present in the morning before arising but was relieved somewhat after she was up and had put on a girdle. It recurred in the afternoon. Weather did not affect the pain. At the age of 16 years she was first seen by an orthopedic consultant, who said that her pelvis was not properly alined. She stated that she may have had poliomyelitis at the age of 9 years.

The patient was examined by members of the Department of Bone and Joint Surgery. The spine was flexible. The pelvis was tilted down to the left. The left shoulder was slightly lower than the right. Lumbar lordosis was exaggerated. There was no gross paralysis in the extremities. A ¾ inch lift under the heel was advised and roentgenograms of the lumbosacral spine were ordered (fig. 3).

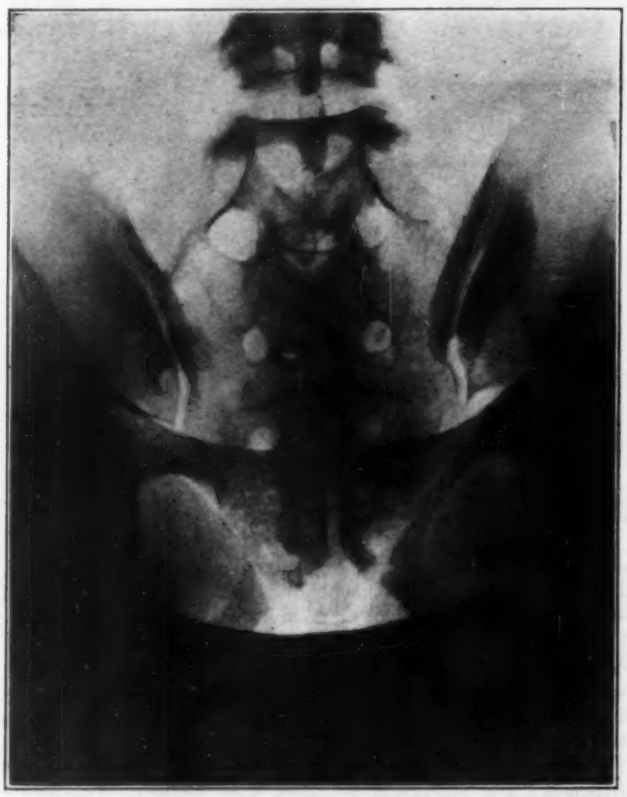

Fig. 2.—Osteitis condensans ilii showing involvement of the middle two thirds of the ilium adjacent to the sacroiliac articulation. This shows sharp demarcation between normal and abnormal bone and normal joint space.

The roentgenologist's report was as follows: "The anteroposterior and lateral views of the dorsal and lumbar spine show a scoliosis convex to the left in the lumbar region, with rotation of the body to the side of the curve. The bones of the lumbar spine otherwise appear normal. There is moderate reaction around both sacroiliac joints, more marked on the right. Interpretation: Scoliosis of the lumbar spine and bilateral sacroiliac arthritis."

Fig. 3.—Osteitis condensans ilii with involvement of the entire ilium adjacent to the sacroiliac joint.

The hemoglobin was 80 per cent and the red blood cells numbered 3,900,000. The Hinton test gave negative results. In addition to the lift to the heel, infra-red treatment was given.

The patient was not seen again until Dec. 8, 1943, at which time she complained of pain in both hips and in the lower part of the back. She stated that she had never had an acute attack of pain; it had been referred down the posterior aspect of the legs to the foot but never to the toes. Coughing and sneezing had no effect. Standing or riding horseback produced a tired feeling with achy pain. The backache increased just before and during the menstrual period. About one year before her second visit she began having pain in both hips, more noticeable on assuming the erect position after sitting for a while. After she moved about the pain was relieved, but the attacks had become progressively worse.

On examination the patient appeared to be well nourished and intelligent. She weighed 123 pounds (56 Kg.) and was 5 feet 4 inches (163 cm.) tall. At this time there was slight lumbar scoliosis.

Blood examination revealed hemoglobin 98 per cent, red blood cell count 4,260,000 and white blood cell count 7,800. The differential count was normal. The sedimentation rate was 15 mm. per hour.

The spine was again studied. Anteroposterior and lateral views of the lumbosacral spine, pelvis and hips showed a bilateral condensing osteitis limited to the iliac bone. Otherwise the bones were normal, except for a rotary scoliosis of the lumbar spine to the left.

This patient, followed over a period of three years, has not obtained relief of pain, which has definitely increased during the last year.

CASE 4.—A woman aged 31 came to the clinic complaining of low back pain and sciatica of three years' duration. There was no history of injury. The onset was about three years previous to entry, at which time she stooped to pick up something and was then unable to straighten up. She was in bed for about one month following this attack. Since then she had had two or three attacks precipitated by lifting or stooping. The pain was in the low back and was dull and aching in character, with sharp pain running down the back of the right thigh, through the posterior portion of the calf and the ankle. It was relieved when she rested and was worse on coughing and sneezing during an acute attack. She also had pain in the upper portion of the spine, extending down the spine. She had had four pregnancies.

On physical examination the patient was 5 feet 4 inches (163 cm.) tall and weighed 190 pounds (86 Kg.). She was obese and had a waddling gait. Physical examination was not significant other than for tenderness over the lumbosacral spine, inadequate musculature and increased lumbar lordosis.

The patient was advised to wear a low back support and was referred to the Department of Internal Medicine for a reduction regimen.

Laboratory examination revealed hemoglobin 98 per cent, red blood cell count 4,890,000, white blood cell count 7,150 and a normal differential count. The Hinton test gave negative results. The sedimentation rate was 1 mm. in one hour. Roentgenographic examinations of the lumbar spine, anteroposterior and lateral views, showed a moderate osteitis of both sacroiliac joints without narrowing of the joint space (fig. 4). The bones otherwise appeared normal.

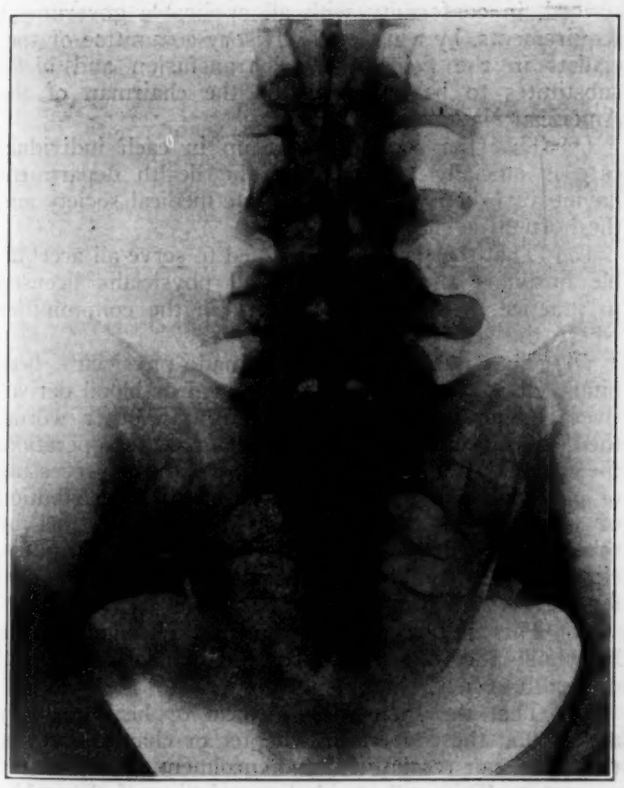

Fig. 4.—Osteitis condensans ilii showing involvement of the lower two thirds of the ilium.

The patient was seen again eleven months later. She had lost 23 pounds (10 Kg.) but the backache and sciatica had continued.

CASE 5.—A single woman, aged 26, first came to the clinic on Jan. 15, 1943 complaining of pain in the left buttock of three years' duration. The pain extended halfway down the thigh. There was low backache, which was worse on coughing. Three weeks before entry she had had the most severe attack of pain; it had disturbed her sleep and had been present on arising in the morning.

Physical examination revealed that the patient appeared to be healthy and was not in obvious distress. She weighed 118 pounds (53.5 Kg.). Examination gave negative results except for slight pain on the left on attempting the leg raising test.

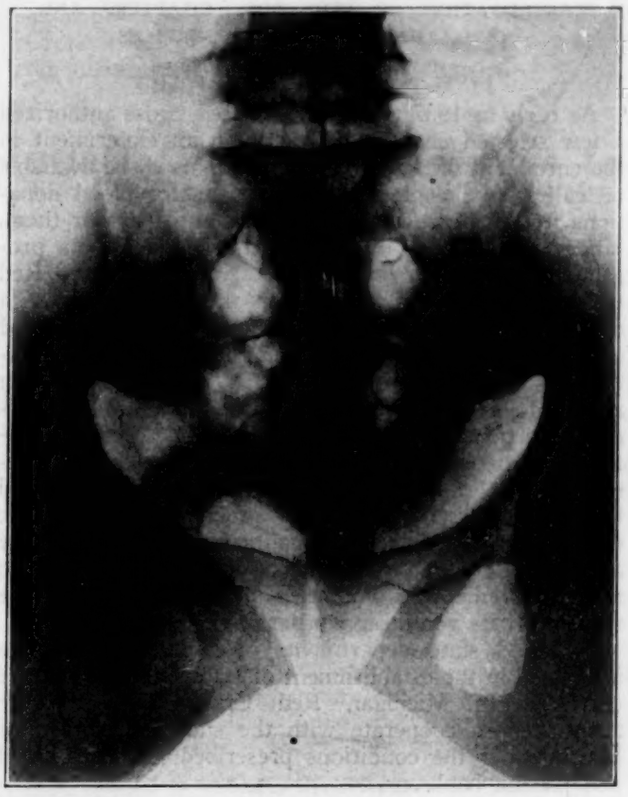

Fig. 5.—More advanced stage of disease, with involvement of the auricular portion of the ilia.

Laboratory examination revealed hemoglobin 96 per cent, red blood cell count 4,730,000 and white blood cell count 8,700. The differential count was normal. The Hinton test gave negative results. The sedimentation rate was 63 mm. per hour.

The roentgenologist's report was as follows: Anteroposterior and lateral views of the lumbosacral spine, pelvis and hip showed a low grade dense osteitis of both sacroiliacs, the process being symmetrical. There was slight narrowing of the joint spaces (fig. 5). The bones otherwise were normal.

COMMENT

This series of 23 cases in which the chief complaint was recurrent attacks of chronic low back pain represents a group in which in the past the diagnosis has been arthritis. In 8 of the 23 cases the pain occurred following or during pregnancy and in 8 cases there was radicular pain. The roentgenographic changes noted were common to all 23 patients, namely a condensation of bone of the inferior medial margins adjacent to the sacroiliac articulation, with the joint space and sacrum remaining normal.

The etiology of osteitis condensans ilii is unknown and any attempt to explain the cause of the pain resulting from these changes has been unsatisfactory. These cases must not be placed in the category of chronic arthritis.

Conservative treatment, namely heat and massage, has in most instances relieved the periodic attacks of pain, but for those patients who have long periods of incapacitation, operative fusion of the sacroiliac articulation on the painful side might justifiably be considered.

605 Commonwealth Avenue.

Special Article

THE AMERICAN RED CROSS

ANNOUNCEMENT OF NEW POLICY GOVERNING THE PARTICIPATION OF RED CROSS CHAPTERS AND CIVILIAN BLOOD DONOR SERVICES

DEVELOPMENT OF THE POLICY

As early as 1937 the American Red Cross authorized a few selected chapters to carry on an experiment in the enrolment of volunteer blood donors to be available on call from hospitals and physicians for blood donations free of charge to those not able to pay for them. Under the stimulus of the war, the blood plasma program of the Office of Civilian Defense and the Red Cross blood donor service for the armed forces, a demand arose from many communities for local blood or plasma banks for civilians. The national organization responded in March 1942 by providing that, on approval by the national medical director, chapters might participate in such undertakings on certain specified conditions. Chief among these were the requirements that the project must be sponsored and operated by the local medical society, the city or state health department or a specially qualified hospital laboratory and that the chapter's participation must be limited to the procurement of volunteer blood donors and the services of its volunteer workers.

By 1943 state departments of health had become interested in the establishment of statewide blood donor services. In Michigan Red Cross chapters were authorized to cooperate with the state department of health under the conditions prescribed for local blood and plasma banks.

By 1944 the successful use of plasma and other blood derivatives for the armed forces and the association of the American Red Cross with the procurement of blood for this purpose had resulted in a widespread demand that the Red Cross, out of the abundance of its experience, render a similar service to the civilian population. The Medical and Health Advisory Committee of the American National Red Cross recommended that a study be made as to the need for continued Red Cross activity in civilian blood donor services. Accordingly, the study was undertaken and consultation held with the United States Public Health Service, the Board of Trustees of the American Medical Association, the Conference of State Medical Society Secretaries and editors of state medical journals, the Association of State and Territorial Health Officers, the American Hospital Association and others. There was general agreement that the Red Cross should authorize its chapters to cooperate with state and local health departments and other reliable medical and health agencies in the procurement of blood for civilian use.

By 1945 several states, cities and counties were engaged in or planning programs to supply blood and blood derivatives for civilian use, and chapter participation in a dozen or more of these programs had already started or was under discussion. The special Medical and Health Survey Committee of the American National Red Cross reviewed the whole matter and made detailed recommendations to the chairman concerning a sound basis for Red Cross participation in civilian blood donor services. The question was carefully considered also by the administrative and technical staffs of the American National Red Cross, with the result that previous instructions governing the participation of chapters in local blood or plasma banks have been superseded by the following policies, principles and procedures.

THE POLICY

Chapters of the American Red Cross desiring to do so may participate in civilian blood donor services only on the receipt of authorization from the area manager. Such authorization may be granted only when the following conditions are met:

(*a*) That the responsibility for technical operations, staff and equipment rests with a reliable medical or health agency.

(*b*) That participation of the chapter is limited to the recruitment or enrolment or both of volunteer donors and the provision of nontechnical staff and equipment.

(*c*) That the community is not serving as a source of blood for the Army and the Navy or, if it is, that the amount of blood required for civilian needs is obtainable over and above the needs of the armed forces.

(*d*) That participation of the chapter is limited to one program of volunteer blood donor service for civilians in any one community. If two or more medical or health agencies wish to sponsor programs in the same locality with Red Cross participation, a joint arrangement shall be developed.

(*e*) That the sponsoring medical or health agency meets the minimum technical standards specified by the American National Red Cross. These will be prescribed, in conformity with all applicable government requirements, by a national advisory committee of specialists in the field of blood transfusion and blood substitutes to be appointed by the chairman of the American National Red Cross.

(*f*) That the service as set up in each individual case is officially approved by the health department having jurisdiction, the appropriate medical society and the hospital agency.

(*g*) That the service is designed to serve all acceptable hospitals and clinics and all physicians licensed to practice medicine and surgery in the communities where the service is conducted.

(*h*) That no charge is to be made physicians, hospitals, clinics or patients for the blood or blood derivatives produced under the program. In other words, the costs of donor recruitment, donor center operation, the collection and transportation of blood, the processing of plasma and other by-products, and the distribution of whole blood and its derivatives must be met by other means than a charge to physicians, hospitals, clinics or patients for any of the products furnished for use.

(*i*) That the care and protection of donors is to be wholly the responsibility of the sponsoring medical or health agency.

(*j*) That the sponsoring medical or health agency agrees that the cooperating chapter or chapters will be the sole donor recruitment and enrolment agency for the program. This will avoid the confusion of the public and the consequent loss of effectiveness of appeal that would ensue if responsibility should be shared with other agencies in the community. However, it should be understood that cooperative relationships may be established with local agencies which are interested in assisting the chapter by recruiting donors from their personnel or their constituencies.

(*k*) That blood donors are to be recruited on a voluntary basis and blood is not to be accepted from any person paid to donate.

(*l*) That the Red Cross is to be responsible for seeing that there is adequate publicity for donor recruitment, to acquaint the public with the purposes for which its blood is to be used.

(*m*) That the chapter is in a position to finance its part of the project without financial assistance from the national organization.

(*n*) That the American National Red Cross is permitted to draw on reserves of blood or blood derivatives as occasion may require for use in disasters or other emergencies.

ADMINISTRATION OF THE PROGRAM

1. *In Chapters.*—An application for authorization to participate in a civilian blood donor service must be submitted by the chapter chairman to the area manager for approval before the chapter may take part in such a project. When authorization from the area manager has been received, the chapter will appoint a Civilian Blood Donor Service Committee to conduct and supervise the chapter program. This committee should include representatives from appropriate chapter services, the medical society, the health department and the hospitals. The chapter committee on Civilian Blood Donor Service will look to the area medical director for advice and guidance in the conduct of the program.

2. *In the Area Offices.*—The conduct of the program in the areas is a function of the area medical director. He will maintain liaison with public and private medical and health agencies operating programs to supply blood and blood derivatives and will supervise the civilian blood donor service operations conducted by the chapters.

3. *At National Headquarters.*—Under the general supervision of the national medical director, the director of Civilian Blood Donor Services will maintain liaison with the national advisory committee of specialists in the field of blood transfusion and blood substitutes. He will prepare the technical standards for the guidance of the sponsoring medical and health agencies in the procurement and processing of human blood, and the necessary basic instructions covering the policies and procedures for the guidance of chapters in the procurement and enrolment of donors. He will give general supervision to the operation of the program and will be available as a technical consultant through the area offices.

CHAPTER PARTICIPATION

Authorization will be granted to Red Cross chapters to participate in civilian blood donor services only in case the chapter and the sponsoring agency meet the terms and conditions stipulated by the American National Red Cross. This requirement is in the interest of giving to the civilian population the benefit of the intensive experience gained by the American National Red Cross and the agencies associated with it in the operation of its blood donor service for the armed forces. It will also encourage the establishment, on a nationwide basis, of proper standards of donor procurement and enrolment and of blood procurement and processing. The continuance of the American Red Cross in the field of blood donor service, for which its name and emblem have virtually become the symbol during the war, should inspire public confidence and stimulate a more ready response on the part of volunteer blood donors. This should facilitate the widest possible distribution of the products of blood donor services to those who need them.

Medical and health agencies which now have or are planning a program to furnish blood and blood derivatives for civilian use and are interested in obtaining the assistance of Red Cross chapters should contact their chapter if the territory the program is to serve is within an individual chapter's jurisdiction, or the appropriate area office of the American National Red Cross if the program is to serve a territory involving the jurisdiction of more than one chapter.

Clinical Notes, Suggestions and New Instruments

EOSINOPHILIC GRANULOMA OF BONE

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Eosinophilic granuloma of bone was reported simultaneously in 1940 by Otani and Ehrlich [1] and by Lichtenstein and Jaffe.[2] Since then about 30 cases of this condition have been described.

Eosinophilic granuloma is a destructive bone lesion, which may be either single or multiple. It is characterized histologically by the presence of large mononuclear cell histiocytes and collections of eosinophils. The prognosis of the lesion is excellent.

ETIOLOGY

The cause of the condition is unknown. Trauma has been felt to be responsible by some; others have postulated a virus infection. The lesion is generally considered to be of an inflammatory nature, although all attempts to isolate an organism from the lesion have been unsuccessful.[3]

Eosinophilic granuloma is seen most commonly in children and in young adults. Males are more frequently affected.

CLINICAL FEATURES

The symptomatology is referable primarily to the skeleton.[4] The lesions are often solitary, involving the bones of the skull or pelvis and the vertebrae, ribs or long bones. Flat bones are more often involved. Cases with multiple lesions have been reported, as many as twenty-five in 1 case.[4] Patients complain of pain, swelling and tenderness in the region of the bony destruction for several days to months before the condition is discovered. Other symptoms that may be encountered are muscle spasm and muscular atrophy. Lesions may be asymptomatic and picked up only by x-ray examination. When multiple lesions are present, only few of them may cause discomfort. There may be slight fever, some elevation of the leukocyte count, anorexia and weight loss. Eosinophilia of 4 to 11 per cent has been observed in some cases. All of the blood chemical findings are characteristically normal.

X-ray examination reveals a destructive, well localized lesion.[5] In Farber's [4] series the lesion did not expand the cortex but some eroded it. The lesions developed rapidly and showed little periosteal reaction. Jaffe,[3] however, reports that in areas of cortical perforation periosteal bone formation is noted. He also observed expansion of the cortex. The bone destruction may result in spntaneous fracture.

PATHOLOGY

Characteristically, in the early stage, when the patient first has complaints, the lesion appears cystic and hemorrhagic and contains a soft yellowish brown material. Microscopically the lesion is granulomatous. Sheets of large, pale mononuclear

From the Fourth Medical Division of New York University, Bellevue Hospital, New York, Dr. Charles H. Nammack, director.

1. Otani, S., and Ehrlich, J. C.: Am. J. Path. **16**: 479, 1940.
2. Lichtenstein, L., and Jaffe, H. L.: Am. J. Path. **16**: 595, 1940.
3. Jaffe, H. L., and Lichtenstein, L.: Eosinophilic Granuloma of Bone, Arch. Path. **37**: 99 (Feb.) 1944.
4. Green, W. T., and Farber, S.: J. Bone & Joint Surg. **24**: 499, 1942.
5. Hatcher, H.: Eosinophilic Granuloma of Bone, Arch. Path. **30**: 828 (Sept.) 1940.

cells with granular cytoplasm are seen, which may have finely vacuolated cytoplasm or appear "foamy." Eosinophils are also seen scattered throughout, either singly or in clumps. These may be seen in the early stages and be absent in the healing stage. Phagocytic giant cells may be observed near the necrotic material. A sprinkling of lymphocytes, plasma cells and polymorphonuclear leukocytes may be seen, but there is no abscess formation. The characteristic cell is not the eosinophil but the large mononuclear cell.

Fig. 1.—Lesion of eosinophilic granuloma in the shaft of the femur. The lesion is circumscribed and shows destruction of the cortex. The periosteal reaction is not readily seen in this view.

According to Farber the variation in the histologic picture represents stages in the evolution of the lesion. In the early destructive stage mononuclear cells, eosinophilic leukocytes and myelocytes, lymphocytes, plasma cells and neutrophils are seen. In the intermediary stage the eosinophils have disappeared and "foam" cells are noted. In the late stage there is replacement by connective tissue and eventually bone formation. Healing may also occur simply by resolution.[3]

TREATMENT AND PROGNOSIS

Eosinophilic granuloma runs a benign course, with recovery in all reported cases. However, if multiple lesions are present the prognosis must be guarded because visceral lesions may also be present and the patient have Hand-Schüller-Christian's disease.[4]

The treatment is entirely empirical. Good results have been obtained after curettage or after small doses of radiation. It has been shown that some cases with multiple lesions will heal spontaneously if left alone. Biopsies from solitary lesions are often made to prove the diagnosis. This procedure is equivalent to curettage. Often this procedure results in prompt relief of the pain. It is advisable to remove all recognizable pathologic tissue while doing the biopsy, unless it involves great technical difficulties or if the lesion is too extensive. Both treated and untreated lesions resolve in several months to a year.

REPORT OF CASE

Clinical History.—R. P., a white youth aged 17 years, was admitted to Bellevue Hospital complaining of pain in the left knee and anterior portion of the left thigh for two months. Six months before admission he contracted gonorrhea, which was successfully treated with sulfonamides. He was asymptomatic until two months before admission. Since the onset of his present illness he was treated at the outpatient department of another hospital as having gonorrheal arthritis. He had lost 18 pounds (8 Kg.) in the past two months and felt weak and tired. At the time of admission he was unable to bear weight on his left foot.

The systemic review was negative. The past history, other than that mentioned, was not pertinent. The family history was noncontributory.

Physical Examination.—The patient was fairly well nourished. He was in obvious distress, complaining bitterly of pain in the left knee and anterior portion of the left thigh. The knee was not swollen or reddened. There was only slight pain on movement and no reduction in the range of motion. The left thigh was not red or swollen. However, palpation revealed an area of extreme tenderness over the bone at the junction of the middle and upper thirds. No mass could be felt on admission, but a definite mass could be felt in this location after two weeks of hospitalization. The remainder of the physical examination detected nothing unusual. There was no urethral discharge, and prostatic massage yielded no fluid.

Laboratory Examination.—The temperature on admission was 99.4 F. and remained about 100. The leukocyte count was 12,400, with 62 per cent polymorphonuclear leukocytes, 34 per cent lymphocytes and 4 per cent monocytes. The red blood cell count and hemoglobin were normal. The blood calcium, phosphorus, acid and alkaline phosphatase and cholesterol were normal.

X-ray examination of the left thigh revealed a single, well circumscribed, intramedullary destructive process involving the left femur at the junction of the middle and upper thirds, with osteoperiosteal proliferation. X-ray examination of the left knee and hip as well as the remainder of the skeleton gave normal results.

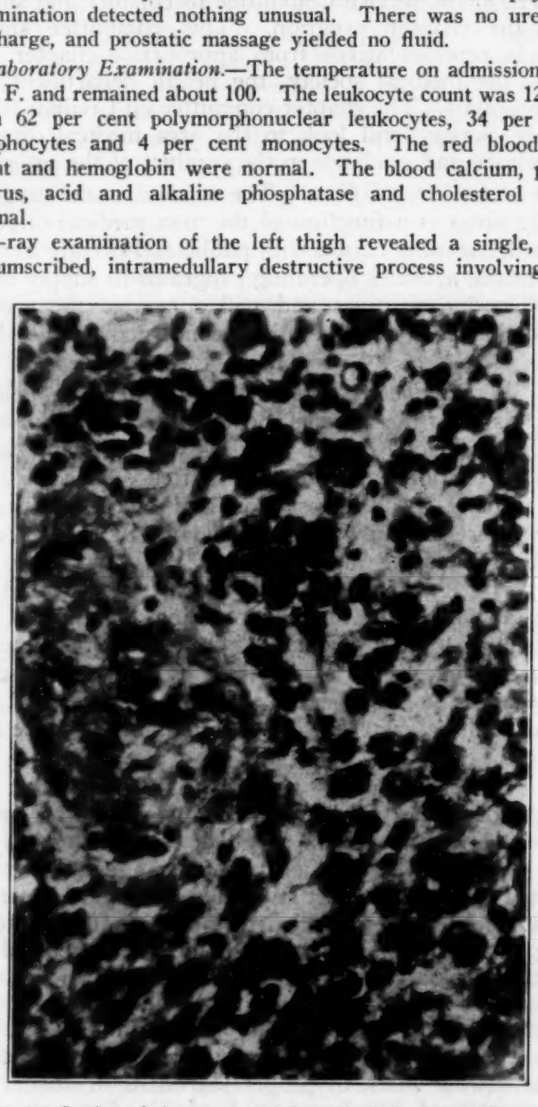


Fig. 2.—Section of tissue curetted from the lesion of the femur seen in figure 1. Large mononuclear cells with pale staining nuclei are seen throughout. The clumps of dark cells represent eosinophils.

Course.—In view of a solitary destructive bone lesion in a young adult, the diagnoses of Ewing's tumor or eosinophilic

granuloma were postulated. Those favoring the diagnosis of Ewing's tumor felt that large doses of radiation were indicated as soon as possible, because of the almost uniform fatality of the tumor. Biopsy was thought to be contraindicated because of the possibility of spreading the tumor. Those favoring the diagnosis of eosinophilic granuloma felt that a biopsy was justifiable before instituting radical therapy. It was decided to do a biopsy. Up until this time the patient required constant sedation because of the pain in the left leg. An incision was made in the anterior portion of the left thigh and a large portion of the bony lesion and underlying marrow were removed. The marrow was yellowish brown and appeared necrotic. The wound healed promptly and the postoperative course was uneventful. Almost immediately following biopsy the patient's pain entirely disappeared; his appetite increased and he started to gain weight. His temperature fell to normal and remained there. His leukocyte count also returned to normal. Repeated differential examinations of the blood failed to reveal any eosinophils. X-ray examination of the lesion one month after biopsy showed considerable reduction in the size of the lesion. The patient was able to walk without pain at this time.

Pathology.—The pathologic report was eosinophilic granuloma of bone. The histologic sections revealed granulation tissue composed principally of large mononuclear cells with granular, faintly staining cytoplasm and oval or reniform nuclei. There was extensive necrosis of portions of the tissue. Scattered throughout the granulation tissue were many eosinophils and a moderate number of plasma cells, lymphocytes and polymorphonuclear leukocytes. Periosteal bone formation was rather conspicuous.

COMMENT

The importance of eosinophilic granuloma is in its differential diagnosis. Because of the x-ray appearance it may be indistinguishable from a neoplastic or other inflammatory lesion. Lesions have been found in all bones except those of the hands and feet. In the case of a solitary lesion in a long bone the site of the lesion is of importance in the diagnosis. If the lesion is in the epiphysis, giant cell tumor should be excluded; this usually occurs in an older age group. Lesions in the metaphysis must be differentiated from a solitary bone cyst; this usually expands the cortex. If the lesion is in the diaphysis, Ewing's tumor must be considered. Other solitary lesions to consider in the differential diagnosis include osteomyelitis and tuberculosis and syphilis of the bone. Multiple lesions simulate multiple myeloma, metastatic bone tumors (neuroblastoma and lymphoma), Hand-Schüller-Christian's disease and osteitis fibrosa cystica.

In our case Ewing's tumor was considered in the differential diagnosis. Ewing's tumor usually causes more pain than eosinophilic granuloma, but in the case presented there was considerable pain. Periosteal bone formation is also more pronounced in Ewing's tumor. Since the prognosis of Ewing's tumor is very poor and its treatment radical, such as extensive irradiation or disarticulation, it is important to establish a correct diagnosis. The only way to do this is by biopsy of the lesion.

The presence of large mononuclear histiocytes or "foam" cells seen microscopically in eosinophilic granuloma has led to much speculation as to its relationship to Letterer-Siwe and Hand-Schüller-Christian's disease.[6] Histologically, the bone lesions of these two conditions are very much like those of eosinophilic granuloma. It has been thought that these three conditions may be the result of the same unknown infectious process, eosinophilic granuloma being the most benign and localized form, being limited to the skeleton.

Letterer-Siwe's disease, which runs a rapid, febrile course, is seen in children and is characterized by hepatosplenomegaly, generalized lymphadenopathy, anemia, purpura and bone lesions.[7]

Hand-Schüller-Christian's disease is a more protracted illness and in typical cases presents the triad of exophthalmos, bony defects of the skull and diabetes insipidus.

The relation of these two diseases to eosinophilic granuloma is based on microscopic findings. They may well represent variations in degree of the same basic process. Certainly there is no clinical alliance, since eosinophilic granuloma attacks only the skeleton and is benign.

6. Mallory, T. B.: New England J. Med. **227**: 955, 1942. Green and Farber.[4]
7. Gross, P., and Jacox, H.: Am. J. M. Sc. **203**: 693, 1942.

SUMMARY

Eosinophilic granuloma is a benign bone lesion seen principally in young males. Pathologically, it is distinguished by the presence of large mononuclear cells. Eosinophils may or may not be present, depending on the age of the lesion. Clinically, pain, swelling and tenderness are noted. The diagnosis is made by biopsy, which is necessary to distinguish it from neoplastic lesions. Lesions may heal spontaneously or following curettage or small doses of radiation. The prognosis is excellent.

HUMAN COCCIDIOSIS

R. M. KISKADDON, M.D., AND R. J. F. RENSHAW, M.D.
CLEVELAND

Human infection with the intestinal protozoan Coccidium[1] is rare. Magath[2] reviewed 208 authenticated cases, approximately three fourths of which were found during World War I among soldiers in the eastern Mediterranean, and an additional 25 cases have been recorded to date.

Although infection usually does not give rise to symptoms, reports in the literature mention diarrhea, abdominal pain, lassitude and slight weight loss in association with coccidiosis. In contrast to the hemosporidia, the malarial parasites, coccidia of the human bowel, Eimeria and Isospora have not been proved pathogenic for man, although Priest[3] assumes cell destruction and invasion of intestinal epithelium by Isospora. The organism has never been found in intestinal tissue, and no specific lesion has been demonstrated. Many therapeutic agents have been used, including bismuth, iodide, quinine, gentian violet, emetine, anthelmintics and others without conclusive evidence of results.

The oocyst, the stage of development usually seen in fresh stool specimens, is ovoid, with a doubly refractile, smooth wall. One pole is smoothly rounded while the other is slightly truncated. The size varies from 21.75 to 40 microns in length and from 10 to 19 microns in width. When first passed it contains granular protoplasm with a clear space at each pole. This central mass divides into eight sporozoites.

Because of the rare occurrence of this organism in man, the following case of Isospora hominis infection coincidental with or superimposed on a chronic ulcerative colitis is reported:

REPORT OF CASE

A man aged 60 was admitted to the hospital because of incontinence of feces and chronic cough of six months' duration. He often passed flatus, frequently had a burning sensation at the anus and occasionally noted blood in the stools. There had been no abdominal pain or weight loss. The patient was carefully questioned about his contact with animals, since coccidia are commonly found in certain animals. He liked to hunt and handled game frequently. His last contact with game occurred seven months previously, when he dressed rabbits, a dozen squab and a few squirrels.

On examination the patient had a temperature of 100.2 F., pulse rate of 88 per minute, systolic blood pressure of 176 and diastolic pressure of 110 mm. of mercury. The liver was slightly tender and enlarged to 1.5 cm. below the right costochondral margin. The edge of the liver was sharp, and there were no nodules.

Roentgenologic examination revealed a slightly enlarged heart, and electrocardiographic changes were consistent with left ventricular preponderance, myocardial damage and intraventricular block. With a barium meal gastrointestinal roentgenologic examination showed a normal esophagus, stomach and duodenum. After introduction of a barium enema a few diverticula in the sigmoid colon were demonstrated, the rest of the

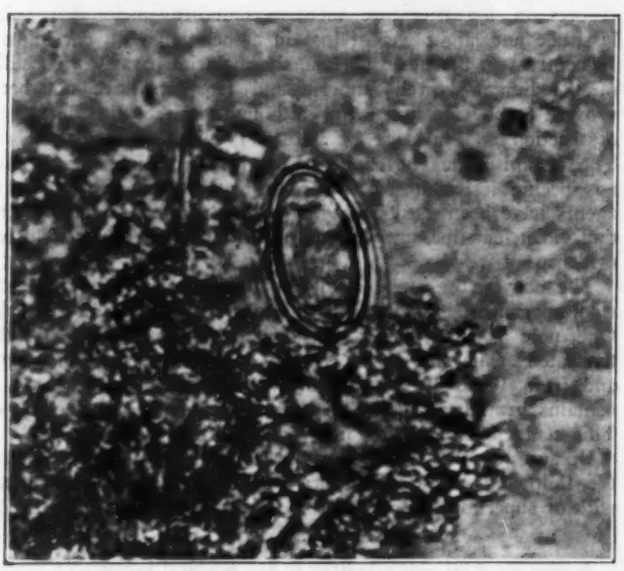
From the Cleveland Clinic.

1. Coccidiosis is not to be confused with coccidioidomycosis, an entirely different entity caused by Coccidioides immitis.
2. Magath, T. B.: Coccidia of Man, Am. J. Trop. Med. **15**: 91-129 (March) 1935.
3. Priest, R.: Case of Human Coccidiosis, J. Roy. Army M. Corps **68**: 317-319 (May) 1937.

colon being normal. The blood examination showed a severe secondary anemia with 4,200,000 erythrocytes and 47 per cent hemoglobin (7 Gm. with the Haden-Hausser hemoglobinometer), a leukocyte count of 8,950 and a corrected erythrocyte sedimentation rate of 0.68 mm. per minute. By the method used the rate is normal up to 0.45 mm. per minute. Consultation with an otolaryngologist confirmed a diagnosis of tracheitis.

Rectal examination revealed external hemorrhoids and poor anal sphincter tone. Proctoscopy for a distance of 25 cm. disclosed a granular, acutely inflamed mucosa, which bled on the slightest trauma but was devoid of ulceration. It had the appearance of Keefer's grade 2 chronic ulcerative colitis in an acute exacerbation.

Cysts of Isospora hominis were recognized[4] in a stool specimen. The parasite had an oval, smooth, doubly refractile wall and a central mass of granular protoplasm enclosed in an inner doubly refractile wall. The average size was about 10 by 7 microns. In some of the parasites, two or three round bodies were observed in the granular substance with no regularity of localization. Specimens were kept at 20 C., at room temperature, in a charcoal suspension and in an acid medium as suggested by Pons.[5] Although the organism was carefully and frequently observed for days and months after isolation from the stool, no division of the central body into sporoblasts was seen, and the small round bodies in the granular substance did not undergo change. The photomicrograph represents the parasite in the only form observed during a four months period.



Cyst of Isospora hominis (magnified) showing oval, smooth, doubly refractile wall and a central mass of granular protoplasm enclosed in an inner doubly refractile wall.

During the patient's stay in the hospital stools were examined daily. A progressively decreasing number of coccidial cysts were observed, and none could be found after the seventh day. On the fourth day an attempt was made to recover the protozoa from the upper intestinal tract by duodenal drainage, but none were obtained. After the seventh day treatment for ulcerative colitis was instituted: 2 Gm. of succinylsulfathiazole in 200 cc. of water as a retention enema twice daily, three 500 cc. whole blood transfusions, ferrous sulfate and polyvitamin mixtures orally and crude liver extract intramuscularly.

On the eighteenth day proctoscopy revealed slight improvement in the appearance of the rectosigmoid mucosa. Blood studies revealed 6,000,000 erythrocytes and 78 per cent hemoglobin, with a color index of 0.65 and a volume index of 0.80. The erythrocyte sedimentation rate was normal. The tracheitis had completely subsided.

After discharge the patient continued the succinylsulfathiazole retention enemas, alternating ten days of treatment with seven days of rest. He was seen on the forty-fourth and again on the one hundredth day after hospital admission, and he reported much symptomatic improvement. He had three to nine stools every twenty-four hours, with only rare gross blood or pus. On both occasions proctoscopy revealed no further change. Examination of the stools showed a few epithelial cells and slight amounts of pus and occult blood but no coccidia. Three subsequent stool examinations between the one hundred and thirtieth and the one hundred and fiftieth days showed no coccidia.

COMMENT

Because division of the granular cytoplasm into sporoblasts and sporozoites was not observed in this case, there is some question whether the organism was a variant of Isospora hominis. There is also some question whether the organism was a sporocyst, because the average size (10 by 7 microns) compares favorably with the average size at the sporocystic stage (13 by 9.5 microns) reported by Magath.[2] We believe that the parasite in this case was a degenerate oocyst or a sporocyst of Isospora hominis.

It is of interest to note that the patient had a large tender liver. Stitt[6] mentions 5 cases of liver infection in men, and it is known that coccidia produce liver abscesses in animals. However, the result of the sulfobromophthalein liver function test was normal in this patient.

SUMMARY

A rare case of human coccidiosis superimposed on an ulcerative colitis was encountered. The only organisms isolated in this case were cysts of Isospora hominis. The infection cleared spontaneously with no specific treatment other than that for the ulcerative colitis.

Euclid Avenue at Ninety-Third Street, Cleveland 6.

4. The cysts were first recognized by Mr. Alfred Reich, chief technician of our laboratories. Dr. William S. Bray of the University of Virginia studied specimens and expressed the opinion that the cysts were atypical but were coccidia of the Isospora group.

5. Pons, R.: Coccidiose intestinale humaine à Isospora belli (Wenyon, 1922); consideration générales, Bull. Soc. path. exot. **18**: 570-584, 1925.

FATALITY ASSOCIATED WITH THE ADMINISTRATION OF AMINO ACID DIGEST

A. R. Curreri, M.D.; O. V. Hibma, M.D., and P. P. Cohen, Ph.D., M.D.
Madison, Wis.

The more recent literature on the parenteral administration of amino acid (protein digests) reveals that only occasionally are mild to moderate reactions encountered. Furthermore, it has been demonstrated that these reactions will subside either on reduction of the rate of flow of the infusion or on discontinuance of its administration. Our experience at the Wisconsin General Hospital with approximately two thousand parenteral administrations of amino acids has been similar to that of other investigators. Recently, however, 1 of our patients developed a severe and bizarre reaction which terminated in death. Since, to our knowledge, no mortality has been previously recorded with the use of amino acids, we present this case.

REPORT OF CASE

A white man aged 39, admitted for herniorrhaphy, presented no pertinent symptoms or signs other than those associated with right indirect inguinal hernia. Laboratory studies of the urine and blood were within normal limits. Hemoglobin was 17.7 Gm. The serologic reaction was negative. In view of the normal findings, this patient was selected for nitrogen balance studies. Accordingly, he was placed on a daily feeding program which consisted of the following: orally, 1,200 cc. of orange juice whose nitrogen and carbohydrate content was known; parenterally, 1,000 cc. of 7.5 per cent glucose followed by 1,500 cc. of a mixture containing 5 per cent amino acids and 5 per cent glucose. An indwelling catheter was inserted into the urinary bladder to insure complete collection of the urinary output.

The first two days were uneventful. On the third day the patient developed a chill, headache, emesis and a fever of

6. Stitt, E. R.; Clough, P. W., and Clough, M. C.: Practical Bacteriology, Haematology and Animal Parasitology, ed. 9, Philadelphia, P. Blakiston's Son & Co., 1938, p. 440.

From the Departments of Surgery and Medicine, University of Wisconsin Medical School.

101 F. after 150 cc. of amino acids had been given. He was seen immediately, but the observer felt that we were dealing either with a moderate reaction or with an early cystitis. Nevertheless the fluids were discontinued, but unfortunately the remaining fluids were discarded by the nurse. Within three hours the temperature rose to 106 F., the blood pressure became imperceptible, the pulse was rapid and thready, the body took on a dusky red color and the patient was quite agitated. The progress was one simulating hypothalamic hyperthermia, shocklike state and renal failure. Supportive treatment consisted of parenteral saline solution and glucose, adrenal cortex extract, epinephrine and tepid sponges. On two occasions he was given intracardiac epinephrine. The patient died forty hours after the onset of symptoms.

Postmortem studies performed by our pathology department revealed generalized congestion of all the organs. The heart showed a minute acute abscess of the epicardium. There was congestion of the spleen with hyperplasia of the red pulp and leukocytic infiltration. The liver showed slender hepatic cells, hepatitis and infiltration of portal canals with lymphocytes and occasional polymorphonuclear cells. Chronic and acute cystitis was present. On gross examination of the brain there was demonstrable congestion and dilatation of the vessels. Microscopically some of the dilated vessels contained leukocytic thrombi made up largely of primitive blood cells. Many microscopic areas of perivascular degeneration were present. In addition there were many areas of endothelial congestion and destruction in all organs. It was concluded that these changes were the result of toxic chemical damage.

COMMENT

In reviewing this case it is difficult to state unequivocally the exact cause of death. We can consider four factors: (1) the presence of pyrogens in the glucose solution or tubing, (2) the presence of antigens or pyrogens in the amino acid solution, (3) extreme sensitivity of the patient to the drug and (4) the possibility of bacterial contamination in a previously opened container of amino acid solution.

The Wisconsin General Hospital prepares all saline and glucose fluids for parenteral use in the surgical section. These solutions are utilized only over a twenty-four hour period. A check of the solutions prepared and used at the time of this unfortunate reaction failed to present any other reactions whatever, even though 100 or more liters is used daily. Consequently we feel that we can rule out the glucose solution or tubing as a possible cause for this reaction.

The question of reactions due to antigens or pyrogens in the amino acid solution had been thoroughly studied by many investigators. Early in the history of the preparation of this agent it was shown that incomplete breakdown of protein, presence of minimal amounts of pork pancreas and a low p_H of the solution could either singly or in combination produce reactions. At the present time, however, the manufacturers test every batch of solution for the presence of these antigens or pyrogens. Furthermore, in a conference with the manufacturers of this particular amino acid preparation we learned that a thorough investigation of their records showed neither a serious reaction nor fatality from amino acids made up at the same time as the one used in this case. We would also point to the fact that the picture presented by this patient differed remarkably from those seen in 1939-1940 when we saw antigenic and pyrogenic reactions to these solutions. In those instances the principal features were a sudden pronounced hyperthermia, chill, nausea and vomiting, which subsided over a period of hours. At no time did we observe an extreme shocklike picture associated with hyperthermia as noted in this case.

During the period that this patient received amino acids, it was noted that several liters of solution contained a precipitate of tyrosine crystals. Such solutions were discarded in keeping with the manufacturer's instructions. It is certain that no precipitation was present in the ill fated solution.

While on the subject of precipitation, we wish to emphasize that amino acids should not be used in combination with strongly alkaline solutions. This fact has a very definite and practical value today, when (1) considerable amounts of sulfonamides are given intravenously and (2) employment by hospitals of itinerant nurses who fail to use care either in the handling or in the administration of intravenous fluids. For example, one of our new nurses poured some amino acid digest into a flask containing approximately 50 cc. of sodium sulfadiazine and walked out of the room. Immediately the resulting solution precipitated and turned milky white, owing to the precipitation of sulfadiazine. Fortunately the infusion was quickly stopped by a resident who happened to be at hand. In all likelihood the incompatibility of this solution applies only when the ingredients are mixed outside the body.

As amino acid solutions represent excellent mediums for bacterial growth and since bacteria break down amino acids to toxic amines, the theory was advanced that a previously opened bottle was employed. It has been our policy, especially since the manufacturers specifically so advise on their bottle labels, never to reuse a bottle of amino acids once it has been opened. It was indeed unfortunate that the remaining solution in this reported case was discarded, because the results of bacterial and chemical studies would have aided immeasurably in determining the cause of death.

This case was a rather bitter experience for us. Nevertheless we feel that the parenteral use of amino acids has a very definite place in the treatment of debilitated patients who cannot take foods orally. Sufficient evidence is now at hand to show the superiority of wound healing and more rapid convalescence when a positive nitrogen balance is maintained. If this reaction which resulted in death were to be the sole cause in deterring the use of this valuable adjunct, then blood transfusions, vitamins and most of our valuable drugs should be deleted from our medical armamentarium, since one or more deaths have resulted from their application. At the same time we definitely feel that these amino acids should be used with care, and that probably some one on the hospital staff should assume responsibility for (1) clearness of amino acid solution, (2) slow rate of administration, (3) certainty of not mixing amino acids with solutions of a high p_H and (4) discarding unused contents of a bottle once it has been opened.

Since we were unable to prove unequivocally that this death was due to the amino acids per se rather than to some extraneous factor or factors, we do not feel justified in stressing any additional potential dangers of parenteral amino acid administration other than those already known.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

RIBOFLAVIN (See New and Nonofficial Remedies, 1944, p. 613).

The following dosage form has been accepted:

PREMO PHARMACEUTICAL LABORATORIES, INC., NEW YORK

Tablets Riboflavin: 1 mg., 2 mg. and 5 mg.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage form has been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Penicillin Sodium: 100,000 Oxford unit bottles.

SYNTHETIC OLEOVITAMIN D (See New and Nonofficial Remedies, 1944, p. 623).

The following additional dosage form has been accepted:

MEAD JOHNSON & COMPANY, EVANSVILLE, IND.

Viosterol in Oil: 10 cc. bottles. Viosterol in corn oil.

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SATURDAY, JULY 7, 1945

THE ROLE OF ESTROGENS IN PHYSIOLOGIC HYPERPIGMENTATION

Davis and his associates [1] at the Lying-In Hospital of the University of Chicago administered diethylstilbestrol to a group of young women with primary amenorrhea after all other measures had failed. After starting administration of 1 mg. of diethylstilbestrol daily, these girls matured rapidly and their reproductive organs reached a normal state of development. The nipples, the areolas and the linea alba, it was noted, pigmented intensely. The degree of pigmentation far exceeded that seen during normal gestation. Administration of diethylstilbestrol to some 1,000 patients with menopausal complaints gave the usual satisfactory response, but the patients did not exhibit an increase in pigmentation in the usual localities, even though the total dosage of estrogens far exceeded the amount administered to the young girls with primary amenorrhea.

In an attempt to elucidate the mechanism of estrogenic pigmentation and the reason for the difference in response in primary amenorrhea and pregnancy, the investigators performed a number of animal experiments. Ten castrated young guinea pig males were injected every other day with 25 micrograms of diethylstilbestrol dissolved in 0.1 cc. of sesame oil. Five days after beginning, the animals began to show considerable pigmentation about the nipples. This pigmentation reached its maximum at the end of two weeks. A control group of animals in which sesame oil alone was injected did not develop pigmentation. Diethylstilbestrol applied locally to the nipple of a guinea pig likewise resulted in this phenomenon, indicating that the action of estrogens on the melanoblast cells in mammals is a direct one. A group of animals given 25 micrograms of diethylstilbestrol and 75 international units or 0.1 cc. of chorionic gonadotropin failed to display the phenomenon of estrogen induced pigmentation. Inhibition of pigmentation in this set of experiments is probably the result of chorionic cell activity. Pigmentation of pregnancy and artificially induced pigmentation by estrogens are both dependent on a pituitary-gonadal relationship. In this relationship estrogens can replace the absent or ineffective gonad when the anterior lobe of the pituitary is functioning normally. In these experiments neither prolactin, progesterone nor the adrenals appeared to play a role in the pigmentation. In pregnancy the increased amount of estrogenic substances present in the body predisposes to hyperpigmentation of the nipples, the areolas and the linea alba as well as to the characteristic deposition of pigment on the face with the production of the typical "mask of pregnancy." The hyperpigmentation is always limited to areas naturally containing pigment. The experiments confirm the role of the estrogens in physiologic hyperpigmentation. The hyperpigmentation observed in the young women treated with estrogens probably develops as a result of the establishment of a normal pituitary-gonadal relationship by the substitution of estrogens for the absent ovarian function. The authors suggest that a good pigmentary response in these young women is diagnostic of primary ovarian failure in the presence of a normal pituitary gland. The absence of hyperpigmentation in women treated with estrogens after the menopause is probably due to the anatomic and the functional changes of the anterior lobe of the pituitary gland.

Thus it appears that there are real differences between the pituitary-ovarian relationships in primary ovarian failure, pregnancy and the postmenopausal period.

1. Davis, M. Edward; Boynton, M. W.; Ferguson, J. H., and Rothman, Stephen: Studies on Pigmentation of Endocrine Origin, J. Endocrinol. 5: 138 (March) 1945.

MILK SICKNESS: A RETROSPECT

In an address before the Filson Club in Louisville, Ky., Philip D. Jordan [1] of Miami University, Oxford, Ohio, reviewed a valuable chapter in medical history of pioneer days in this country. The once mysterious "milk sickness" for over a hundred years was a scourge among many endemic ills which beset early settlers throughout the Middle West. It affected cattle and man alike. Little was written about it before the great period of colonization in the first half of the nineteenth century. The disease was variously designated as swamp sickness, tires, distemper or trembles. First heard of in Virginia and on the upper Ohio, it soon became common enough in Tennessee, Kentucky, Indiana and the Illinois country.

The symptoms, always incident to the drinking of milk, were dizziness, increasing lassitude, loss of appetite, nausea followed by vomiting, constipation, subnormal temperature, intense thirst and the odor of acetone. This condition in severe cases would develop into a typhus-like appearance with difficult breathing, pros-

1. Jordan, P. D.: Milk Sickness in Kentucky and the Western Country, Filson Club Historical Quarterly 19: 21 (Jan.) 1945.

tration and coma. The death rate was from 10 to 25 per cent.

Early medical literature teems with references to this disease. Early settlers feared it so greatly that they would carefully avoid any region where it appeared frequently. One such place was in southern Indiana, where Nancy Hanks Lincoln was known to have died of it in 1819. Low and swampy localities seemed to favor the prevalence.

The settlers knew that the illness was induced by the drinking of milk. They surmised that its cause might be a poison derived from some venomous substance or plant eaten by the cows. About 1840 the great pioneer physician Daniel Drake undertook a long journey into the Ohio country to trace the cause of the poison. His colleagues variously accused species of Rhus, or Bignonia, but in 1838 John Rowe, a farmer, announced publicly that the white snakeroot (Eupatorium ageratoides, or urticaefolium) was the plant which caused the trembles in cattle and man. This statement was not credited by Drake, and its truth was not recognized until 1917, seventy-nine years later.

The prognosis generally was none too good. Opium, hydrotherapy, blistering and calomel in large doses, whisky, bismuth, charcoal and lobelia tincture were tried, also sodium and potassium bicarbonate. As late as 1937-1938 21 cases occurred in Illinois, with a mortality rate of 10 per cent.

The suspicion gradually centered on the snakeroot (W. J. Vermilya, 1858; N. S. Townshead, 1873) and in 1906 E. L. Moseley showed that snakeroot fed to animals in the laboratory will produce "trembles." E. O. Jordan and his associates in 1908 isolated a bacillus (Bacillus lactimorbi) which would be subject of suspicion, but they did not assert that it was the causative agent. Finally, in 1917 the U. S. Bureau of Animal Industry announced that a poisonous substance, tremetol, had been isolated from the white snakeroot; others confirmed this discovery, and a treatment (saline purgation, fluids, alkalis by mouth, glucose intravenously, enemas, honey and whisky) was devised. Still a specific antidote for tremetol has not thus far been discovered.

The problem of the etiology seems simple, but the careful investigator knows that it only seems so. Cattle feed on hundreds of herbs still not analyzed. The "trembles" presents a mutable picture not uncommon to many intestinal infections or endemic troubles where in earlier days calomel, bleeding or opium was indicated by symptoms. Finally, many poisons show such a variation of the clinical picture that the presence of an unknown substance would confuse even the most experienced practitioner. But as Eupatorium ageratoides still grows in our soil, and as the rayless goldenrod of the Southwest also contains tremetol and causes the trembles, milk sickness may well remain in the textbooks.

MENTAL DECLINE AND ITS RETARDATION

The human life span has been extended from something like 29.4 years for the ancient Greeks to 59.3 for men and 62.8 for women in the United States of America. The number of people over 65 now reach the grand total of 9 million; statisticians anticipate 26 million past 65 in 1980. Thus the question of retardation of mental decline assumes great practical significance. George Lawton [1] of the Old Age Counseling Center, New York, points out that not all of the physical inadequacies of older persons are due to inescapable infirmities of old age. Much results from neglect of physical condition and failure to continue exercise. We gain mental stature quickly, particularly between 13 and 16 years, and lose it slowly. The ability to learn new facts reaches its maximum in the late teens and early twenties and then starts slowly declining. While there is a decrease in the amount of learning which persons acquire as they grow older, exceptional minds possess the ability to renew themselves continually and to exploit to the fullest their intellectual resources. Even ordinary persons have far more ability and learning capacity than they utilize. Part of the ostensible mental loss of older persons is simply the cumulative effect of poor habits of work. From the point of view of the best interests of most older persons, a regular job is necessary and desirable. Lawton believes that retirement is inadvisable for many types of persons.

Many a man or woman thinks creatively and makes invaluable contributions at age levels far beyond early youth. Lawton stresses that it is fear of aging, rather than the aging process itself, which often causes a functional loss in the mental realm, just as it does in the physical. Admitting the inevitable deterioration of our abilities with advancing age, it would be well to remember, as Lawton points out, that every handicap has two aspects. One is the handicap itself. The other is the way the handicap is used.

It is generally conceded that the higher the original intellectual endowment, the slighter the decline. Judgment, better integration of knowledge, practice over a long period of years will compensate for losses in motor dexterity and sensory acuity of the young. Indiscriminate and arbitrary shelving of men and women merely for age results in great loss to society and the individual. Based on his own experience, Lawton believes that retirement on pension, medical care and old age homes will not solve the problem of the older person. Rather he sees the necessity of schools for the aged, recreation centers, arts and crafts centers, sheltered workshops, adult playgrounds, marriage brokers and social clubs. Occupational therapy holds great

1. Lawton, George: Mental Decline and Its Retardation, J. Gen. Psychiat. **32**: 229 (April) 1945.

possibilities in the program of aiding the aged. Recent studies in geriatrics suggest that the medical profession is interested in the problems of the aged and that much constructive work is going to result from such studies.

Current Comment

POSTGRADUATE COURSES FOR VETERANS AND CIVILIAN PHYSICIANS

On page 751 of this issue of THE JOURNAL the Council on Medical Education and Hospitals of the American Medical Association presents its semiannual compilation of postgraduate continuation courses being offered in a wide variety of fields in the various medical educational institutions of this country. This list includes courses offered for the period of July 1, 1945 to Jan. 15, 1946. Before the expiration of this period another listing will be published. The present compilation is especially important and timely. It includes a number of courses which have been designed primarily to meet the needs of returning physician veterans. Already a large number of educational institutions are planning to meet such demands. Therefore the list has become considerably larger than any previous compilation. The variety of subjects covered is especially extensive, and the geographic distribution of the institutions offering this work is wide. It is hoped that the list will continue to grow as more institutions formulate definite plans for returning medical officers and that this and subsequent listings will become increasingly useful, especially to returning physicians who desire review and refresher courses.

VIVISECTION EXHIBITIONISM

Dr. Franklin Bliss Snyder, president of Northwestern University, Dr. George A. Gardner, acting dean of the Medical School, and Dr. Andrew C. Ivy of the physiology department, charged with cruelty to animals by Mrs. Grace Petkus, vice president of the Animal Welfare League, aided and abetted by Mrs. Irene Castle McLaughlin, were recently tried in a Chicago municipal court. After the testimony was heard, the judge dismissed the case. Reporters recognized the incident as merely another of the episodes involving the ex-actress and terpsichorean who seems to hanker continuously for the limelight and plaudits which once were hers. Said the Chicago *Sun*, in the issue of June 29, "That old courtroom drama, which might be called 'The Vivisection Blues' and which has played more return engagements here than 'Rose Marie,' was on the boards again yesterday, this time in the Chicago Avenue Court before Judge John R. McSweeney. Mrs. Irene Castle McLaughlin appeared again as the emotional chief witness, a role she created years ago, for medical science and against Hearst's Chicago *Herald-American*, which for a decade or so has been the play's angel. It was the consensus afterward that unless a happier ending can be achieved 'The Vivisection Blues' never can be taken on the road." The Chicago *Tribune* featured Mrs. McLaughlin's costume. The Chicago *Times* said "Irene's crying act leaves court cold" and in a semifacetious manner emphasized Mrs. McLaughlin's clothes. The *Daily News* just noticed the incident, but the Hearst *Herald-American* devoted a column on page 7 to saying "We haven't begun to fight." Inadvertently, Mrs. McLaughlin disclosed the real issue. "Well," she is reported to have remarked, "we got a university president in court for the first time, anyway." The antivivisectionists' purpose then is not the protection of animals but the heckling of scientists and, perhaps most important, getting their names and their pictures in the paper. We have seen la belle Castle's summer outfit; by next fall she will be ready no doubt to exhibit something special in furs from small animals trapped in the woods.

PENICILLIN VARIATIONS

After the discovery of penicillin and the rapidly expanded commercial production which made it readily available, a vast literature accumulated concerning the effects of this therapeutic agent on the course of many diseases. Some variations have been observed between the British and American products, particularly when the single dose technic is used. Recently an explanation for the variations [1] stressed the fact that a partitioning of the active components occurs in the course of isolation of penicillin from the Penicillium notatum cultures. The product obtained by growth in open flasks is called penicillin F or penicillin I by the British, while that produced by the tank method is called penicillin G or II. There is also a product designated penicillin X, III or allopenicillin. Since penicillin production by the tank-submerged cultures gives the greatest yield, this type of product is in most common therapeutic use; it is almost exclusively the G type penicillin. Evidence suggests that each fraction has therapeutic specificity. In the case of the gonococcus this is most striking; here the G fraction is less active than the crude penicillin, and the X fraction is more active than either of the previous two. However, the content of each fraction present in a single ampule is not known, since fractional assaying has not been considered practical up to the present. The various penicillins vary in proportion not only according to different methods of production but also from one batch of the drug to another produced by the same method. It is obvious that until penicillin can be produced in a chemically pure form the recognition of its variable complex nature should be considered in any attempt to evaluate its action against disease producing agents.

1. Editorial, Naval M. Bull. **44**: 1083 (May) 1945.

MEDICINE AND THE WAR

ARMY

PROMOTIONS IN THE ARMY MEDICAL DEPARTMENT

The following promotions to the rank of brigadier general (temporary) were recently announced by the War Department:

Brig. Gen. Larry B. McAfee, as assistant to the Surgeon General of the Army, is serving as commanding general of Bruns General Hospital, Santa Fe, N. M.

Brig. Gen. Addison D. Davis, as assistant to the Surgeon General of the Army, is serving as commanding general, Carlisle Barracks, Pa., and as commandant of the Medical Field Service School.

Brig. Gen. George W. Rice, surgeon of an army in the Southwest Pacific Area since September 1944.

Brig. Gen. Edward Reynolds, as Chief, Supply Service, Office of the Surgeon General since May 1944. General Reynolds is charged with the procurement, storage and issue of all medical, dental and veterinary supplies for the Army.

Brig. Gen. Charles M. Walson has been Surgeon, Second Service Command, Governors Island, New York, since January 1944.

Brig. Gen. Elliott C. Cutler has been Chief Consultant in Surgery, Headquarters, European Theater, since July 1942.

MORE VETERINARIANS NEEDED

The director of economics stabilization recently directed that immediate steps be taken to bring larger numbers of nonfederally inspected meat producing establishments under federal inspection in order to meet the huge requirements of the armed forces. In line with this directive, several teams have been sent into the field to survey several hundred of these noninspected plants which it is believed can be made to qualify for limited federal inspection. Under agreement between the war food administrator and the secretary of war, signed in February 1944, when the Department of Agriculture cannot supply the inspection at plants brought under federal supervision, in order to contribute to military meat requirements, the inspection service is furnished by the Veterinary Corps. It is anticipated that as a result of the drive now being made to bring under inspection more plants, approximately 150 additional veterinary officers will be required for the program. Accordingly, a recommendation has been submitted to the War Department to raise the ceiling for Veterinary Corps officers to provide for this additional requirement in order to maintain health standards.

262d MEDICAL BATTALION AWARDED PLAQUE

The 262d Medical Battalion, now in action in the Philippines, recently received the Meritorious Service Plaque. The award was made by Gen. Walter Krueger, commanding general of the Sixth Army, who cited the battalion's high standard of efficiency in clearing and evacuating casualties on Leyte Island. The battalion is the third unit of the 2d Engineer Special Brigade to receive the Meritorious Service Plaque. The 262d Medical Battalion is commanded by Lieut. Col. A. E. Rosen, who has been with the unit since its organization at Cape Cod in June 1942.

BRONZE STAR MEDAL

Sgt. Carl E. Stuart, Medical Department, Walthill, Neb., was recently awarded the Bronze Star for his work among the American prisoners in the Philippines. While a prisoner of war he was wardmaster and hospital attendant from November 1943 to January 1945, caring for other American prisoners in the tuberculosis ward of Japanese Prison Camp Number One, Cabanatuan, Philippine Islands. Working under the most hazardous and primitive conditions with a minimum of protection from disease, he gave cheerful, untiring care to his patients even though subjected to constant interference and abuse from Japanese guards and while suffering himself from the ravages of prison life. Improvising equipment and laboring countless hours, he did his utmost for critically ill patients. On the arrival of an American liberation force he continued to care for his patients until all had been removed to friendly lines and he was convinced that medical facilities were available. Only then did he seek treatment for himself. His determined efforts, his loyalty to his suffering comrades and his inspiring conviction that the Japanese yoke would be lifted instilled in many desperately ill captives the will to live through their terrible ordeal.

FRONT LINE MEDICAL CARE SUCCESSFUL

Brig. Gen. Hugh J. Morgan, chief consultant in medicine, Office of the Surgeon General, U. S. Army, who recently returned from a nine week, 15,000 mile tour of the European and Mediterranean theaters of operation, reports that the Army's policy of moving medical care, as well as surgical care, nearer and nearer to the front lines has proved eminently successful.

The primary task of the medical corps is to keep soldiers on active duty, and this is especially vital in combat areas, where regiments, divisions and whole army groups function as a team, with each unit doing its special task. The quality of medical care given in operations areas which General Morgan visited is extraordinarily good, he said. There is the same supervision of all cases by specialists in specific fields of medicine as there is in the United States.

58th EVACUATION HOSPITAL

The 58th Evacuation Hospital, commanded by Col. Charles E. Spellman, formerly of Missoula, Mont., has averaged as many as a thousand cases weekly over a three week period. With a normal bed capacity of 400, the unit found facilities during the heaviest fighting on Cebu to accommodate and care for as many as 800 patients. After serving for more than a year at Camp Carson, Colorado, where it was originally activated, the 58th Evacuation Hospital went into actual operation on a small jungled island in the Admiralty group on March 6, 1944, and with the invasion of the Philippines, Colonel Spellman and his veteran crew set up shop in muddy Tacloban, capital of Leyte. Then followed the setting up of temporary bivouac near the cathedral town of Pardo, and in a few days the 58th followed the American division into the smoking ruins of Cebu City.

NUTRITION SURVEY COMPLETED

Major Marvin B. Corlette, chief, Civilian Nutrition Branch, Nutrition Division, Preventive Medicine Service, recently returned from a seven weeks tour in the European theater, where he was in charge of a nutrition survey team which worked primarily in the Netherlands. This team was with the first troops into Utrecht, Amsterdam, The Hague and Rotterdam after the German surrender. Major Corlette also made brief nutrition surveys in Belgium and Germany and visited the concentration camps at Belsen and Dachau, Germany, where he assisted in formulating plans for feeding starvation cases.

COLONEL SHULL GETS NEW ASSIGNMENT

Following a tour of duty in the Office of the Surgeon General of more than three years, Lieut. Col. Harrison J. Shull, M. C., departed from that office for his new assignment as consultant in medicine to the Sixth Army, in the Southwest Pacific.

Colonel Shull's successor as chief of the General Medicine Branch of the Medical Consultants Division is Major Frederick T. Billings, M. C., recently returned from overseas, where he was assigned to the Medical Service of the 118th General Hospital and also served on temporary duty as a consultant in medicine.

NEW APPOINTMENT

Lieut. Col. Fred E. Ball, formerly of Chicago, has been appointed District Consultant for Internal Medicine to the Air Surgeon. Now chief of Medical Services at the AAF Regional and Convalescent Hospital, Miami District, Colonel Ball is consultant for the Southeast District, which comprises the states of Tennessee, Mississippi, Alabama, South Carolina, Georgia and Florida. Dr. Ball graduated from the University of Minnesota Medical School, Minneapolis, in 1923 and entered the service in 1942.

AWARD OF MERITORIOUS SERVICE UNIT PLAQUE

The 45th Evacuation Hospital (Sm.) was recently awarded the Meritorious Service Unit Plaque "for superior performance of duty in the accomplishment of exceptionally difficult tasks during Dec. 2, 1944 to Feb. 16, 1945."

ARMY AWARDS AND COMMENDATIONS

Colonel Charles B. Odom

Col. Charles B. Odom, formerly of New Orleans, was recently awarded the Bronze Star. The citation accompanying the award read "for heroic achievement in connection with military operations against an enemy of the United States in Germany. On April 6, 1945 Colonel Odom, assistant surgeon, Headquarters Third U. S. Army, voluntarily undertook a daring mission behind enemy lines to give medical aid to wounded allied prisoners held in a prisoner of war camp at Hammelburg, Germany. Traveling at night by quarter-ton truck, braving enemy sniper and mortar fire and the constant threat of ambush, he reached the camp successfully and aided a Serbian medical officer in treating the wounded. The courage and skill and loyal devotion to duty Colonel Odom displayed are in keeping with the highest traditions of the military service." Dr. Odom graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1932 and entered the service July 15, 1942.

Captain R. Hills McArthur Jr.

The Soldier Medal was recently awarded to Capt. R. Hills McArthur Jr., formerly of Clio, Mich. According to the citation accompanying the award "The pilot had attempted to land his aircraft after a dive bombing mission with four phosphorus bombs still attached to the plane. At the first impact of landing one bomb exploded under the tail surfaces of the plane and caused the aircraft to turn over on its back and immediately to catch fire. Captain McArthur rushed to the scene of the accident and without regard for the hazards of pools of gasoline and oil, or to the danger of explosion of remaining bombs, which were emitting smoke, succeeded in removing the canopy. Then, by lying on his back in gasoline and oil and working under the most difficult conditions, Captain McArthur freed the pilot from his harness and parachute and carried him to safety." Dr. McArthur graduated from the University of Tennessee College of Medicine, Memphis, in 1937 and entered the service July 8, 1942.

Lieutenant Colonel Roy D. Arn

The Bronze Star was recently awarded to Lieut. Col. Roy D. Arn, formerly of Dayton, Ohio. The citation reads, in part, "Lieutenant Colonel Arn volunteered for temporary duty in support of a front line unit despite the fact that such duty was not commensurate with his rank, age or assignment to a fixed base hospital. He found the unit after an arduous and dangerous three day trip on foot over the most rigorous mountain terrain and immediately undertook the performance of major surgical procedures which resulted in the saving of many lives. He continued to render his services until the unit finished the combat operation. The enthusiasm manifested by Lieutenant Colonel Arn in volunteering for such an assignment and in the performance of fine surgical procedures which saved the lives of many men reflects great credit on himself and the service." Dr. Arn graduated from the University of Michigan Medical School, Ann Arbor, in 1926 and entered the service May 9, 1942.

Major Thomas Floyd Jr.

Major Thomas Floyd Jr., formerly of Abbeville, Ala., was recently awarded the Bronze Star "for outstanding professional services from June 6, 1944 to January 1945," when he served as a surgeon with the Army Medical Corps under combat conditions. Major Floyd's surgical team performed major operations on 1,040 casualties during this six months period. Attached to a First Engineer Special Brigade, Major Floyd is member of a medical battalion that has been overseas twenty-seven months. He is stationed at a forward field hospital of the First Army, and his was the first army surgical team to operate east of the Rhine, at the Remagen Bridgehead. Dr. Floyd graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1907 and entered the service in September 1942.

Lieutenant Colonel Isidore A. Feder

The Bronze Star was recently awarded to Lieut. Col. Isidore A. Feder, formerly of Brooklyn, "for meritorious service in connection with military operations against the enemy as chief of medical service, 45th Evacuation Hospital, Semimobile, from June 17, 1944 to Aug. 1, 1944 in France. Lieutenant Colonel Feder expertly supervised the diagnosis and treatment of numerous medical cases. He displayed keen insight in properly distributing the medical services of officers, nurses and enlisted personnel to insure prompt and adequate treatment of the wounded. By his initative, professional knowledge and skill, Lieutenant Colonel Feder reflected credit on himself and on the military service." Dr. Feder graduated from Tufts College Medical School, Boston, in 1927 and entered the service Aug. 12, 1942.

Major Allen M. Boyden

Major Allen M. Boyden, formerly of Astoria, Ore., was recently awarded the Bronze Star for "meritorious service as Surgeon, Surgical Team 1, 3d Auxiliary Surgical Group. Arriving on the fire-swept invasion beach of Normandy on D day, Major Boyden immediately undertook his medical tasks. Despite a heavy flow of casualties he calmly and efficiently supervised the treatment of many wounded soldiers, although frequently subjected to enemy artillery and aerial bombardment. During subsequent operations on the continent he consistently performed his assignment in an outstanding manner. By his surgical skill and untiring efforts he set an example worthy of emulation." Dr. Boyden graduated from the University of Michigan Medical School, Ann Arbor, in 1932 and entered the service Oct. 27, 1942. He is now in Germany caring for prisoners and refugees from the notorious German camps.

Captain Nelson M. Black Jr.

The Soldier's Medal was recently awarded to Capt. Nelson M. Black Jr., formerly of Iowa City, "for outstanding heroism displayed at Army Air Base, APO 215, on Dec. 24, 1944. Immediately following the crash of a B-29 type aircraft loaded with bombs, Captain Black rushed to the scene and unhesitatingly faced the danger of the exploding ammunition, incendiary bombs and oxygen tanks, to exert his every effort in finding and rescuing the bodies of the dead and injured crew members from the blazing wreckage. This deed was performed at extreme risk of life, since, in addition to the other attendant dangers, many 500 pound demolition bombs on the verge of explosion from the excessive heat were in the area. The actions of Captain Black in the face of great danger were instrumental in saving the lives of several crew members and were a source of courage to other personnel comprising the rescue party. Such disregard for his personal safety in the execution of an act of courage reflects the highest credit on Captain Black and the Army Air Forces." Dr. Black graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1939 and entered the service Aug. 12, 1942.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

July 2, 1945.

Public Health Service Personnel Get Military Status

President Truman has by executive order given 3,000 U. S. Public Health Service members military status for the duration of the war. This action was taken under authority of the Public Health Service Act of 1944 and is effective July 21. The Public Health Service has no enlisted personnel, and its commissioned corps of around 3,000 includes physicians, dentists, sanitary engineers, pharmacists and other scientists and nurses. The President's order gives this personnel the same status, benefits, discipline and obligations of members of military establishments and provides uniformity in status and in discipline as between various members of the U. S. Public Health Service commissioned corps. Formerly some officers acquired veteran status while others did not, depending on their assignments. The order does not transfer administration of the Public Health Service either to the Army or to the Navy.

Curb Urged on Over Counter Sale of Sulfonamide Drugs

District of Columbia health officials have been asked to curb over the counter sale of sulfonamide drugs by the Committee on Public Health of the Medical Society of the District of Columbia, of which Dr. Edward J. Stieglitz is chairman. The committee also asked the District commissioners to assist District Health Officer Ruhland in effecting such restrictions if necessary. The committee endorsed the recommendations contained in the report of the subcommittee of the committee on public health relations of the New York Academy of Medicine, pointing out the dangers inherent in the use of the sulfonamide drugs. Editorially, the *Medical Annals of the District of Columbia* has expressed the hope that action on the committee recommendations, which was endorsed by the executive board, would be taken soon.

Hospital Center Critics Asked for Better Plan

With the Senate passed bill for a 1,500 bed medical center in the national capital delayed until completion of a Washington hospital survey in the fall, Senator Tydings, Democrat of Maryland, co-author of the measure, has challenged critics to come forth with a better plan. The bill is now before a subcommittee of the House District Committee. Budget Director Harold D. Smith urged delay until the survey and criticized managerial and financial plans for the new center. Said Senator Tydings "Simply to criticize the existing bill, without producing a better or less costly bill to improve or construct hospital facilities, is not helping the hospital situation of the District. In effect it is simply preventing any improvement to the crying needs for better and more modern hospitals and facilities to take care of the growing city."

One Third of Civilian Dentists in Armed Forces

Since 1940 one third of the civilian dentists of the country have gone into the armed services, it was testified before the subcommittee on health of the Senate Committee on Education and Labor. Illustrating the availability of dental care, it was reported that in California during 1940 there was 1 dentist for every 1,279 people, while South Carolina had 1 dentist for every 5,263. This information was disclosed at hearings on the proposal of Senator Murray of Montana to spend a million dollars to establish a National Institute of Dental Research and appropriate an additional $730,000 a year to keep it going. Senator Claude Pepper of Florida and Senator George T. Aiken of Vermont have jointly proposed that federal grants-in-aid be made to the states and local governments so that they can establish and maintain "adequate measures for the prevention, treatment and control of such [dental] diseases, including a dental care program for children, the training of personnel for state and local dental health work and the development and maintenance of effective means for the education of the public concerning dental disease." Dental neglect among children between the ages of 6 and 18 years is said to be such that only about 5,650,000 of the annual crop of 22,500,0000 decayed teeth are filled. The population over age 3 is said to have an accumulated need for 39,500,000 crowns and bridges, 20,000,000 partial dentures, 20,000,000 dental disease treatments and 125,000,000 prophylactic treatments.

Allied Surveillance of German Research Urged by Berge

Assistant Attorney General Wendell Berge told the subcommittee on war mobilization of the Committee on Military Affairs that allied authorities must exercise careful surveillance over German research programs. Pointing out that it was through research that Germany was able to prepare clandestinely for this war, he warned that German officials will endeavor to maintain the core of organized research personnel and technical facilities "on which their know-how depends." He said this war has demonstrated that the fields of major importance are synthetic chemistry, metallurgy, electronics and aerodynamics. When the war ended, he said, Germany was on the verge of developing "new and more terrible instruments of destruction, particularly in the field of long distance rockets and explosives."

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE NEWS

Membership of Hospital Plan Enlarged

The Blue Cross Plan for Hospital Care showed the largest membership increase during 1944 of any year in its history on the enrolment of 163,039 subscribers, bringing the total membership to 747,317, in an announcement made by John R. Mannix of Chicago, executive director.

Medical Service Plan Corporation Authorized in Minnesota

During a meeting of the House of Delegates of the Minnesota State Medical Association at St. Paul on May 19 and 20 plans for creating a statewide voluntary nonprofit medical service corporation were authorized and set into motion.

Considerable discussion was given to the method of selecting the twenty-one incorporators to serve as the original board of directors of the corporation. In order to explain the provision for twenty-one incorporators Dr. A. W. Adson, chairman of the Committee on Medical Service, told the delegates that not only geographic representation of the profession was considered desirable but representation of various specialties as well. The arbitrary number of twenty-one was deemed necessary to provide both—two physicians from each councilor district plus three at large, the latter to be selected by the eighteen members representing the councilor districts.

Preparation of articles of incorporation and formulation of detailed plans after careful study of existing models of the various states were authorized.

The question of whether the Minnesota Medical Service plan will be coordinated with the Blue Cross, as in the case of Michigan, or whether some commercial sickness and accident insurance company will participate in the venture is a decision still to be made by the board of directors.

Bureau of Information

PROGRESS REPORT, JUNE 27, 1945

The progress of the Bureau of Information is not as rapid as is desired, but during recent weeks there has been a gratifying increase in the number of completed county summary sheets received from the state and county medical societies. This response is indicative of a whole-hearted effort on the part of the various societies to aid in the completion of this phase of the Bureau of Information.

The accompanying table gives the returns by county from each of the states as of June 27, 1945.

Summary Sheets Received from State and County Medical Societies

State	Number of Counties	Number of Counties Reported	Counties Unreported
County Returns Complete as of June 28, 1945			
Arizona	14	14	0
Arkansas	75	75	0
Connecticut	8	8	0
District of Columbia	1	1	0
Iowa	99	99	0
Kansas	105	105	0
Kentucky	120	120	0
Louisiana	64	64	0
Massachusetts	14	14	0
Minnesota	87	87	0
Missouri	115	115	0
Nevada	17	17	0
New Mexico	31	31	0
North Dakota	53	53	0
Ohio	88	88	0
Utah	29	29	0
West Virginia	55	55	0
Wisconsin	71	71	0
Total	1,046	1,046	0
Partial County Returns			
Alabama	67	65	2
California	58	10	48
Colorado	63	29	34
Florida	67	23	44
Georgia	159	59	100
Idaho	44	23	21
Illinois	102	101	1
Indiana	92	74	18
Michigan	83	49	34
Montana	56	45	11
Nebraska	93	51	42
New Hampshire	10	8	2
New Jersey	21	7	14
New York	62	58	4
North Carolina	100	26	74
Oklahoma	77	41	36
Pennsylvania	67	1	66
South Carolina	46	23	23
South Dakota	69	54	15
Tennessee	95	60	35
Texas	254	54	200
Virginia	100	51	49
Washington	39	25	14
Wyoming	23	13	10
Total	1,847	950	897
No Returns Received			
Delaware	3	0	3
Maine	16	0	16
Maryland	24	0	24
Mississippi	82	0	82
Oregon	36	0	36
Rhode Island	5	0	5
Vermont	14	0	14
Total	180	0	180
Total counties	3,073		
Counties reported	1,996		
Counties unreported	1,077		

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Survey of Medical Personnel Needs

Under a resolution submitted by Senator Downey, California, S. Res. 134, the Senate Committee on Military Affairs would be directed to make a complete investigation with respect to the relative needs of the armed forces and the civilian population for services of medical personnel to ascertain (1) whether, as a result of developments in the war, or through more efficient utilization of medical personnel, such personnel can be released from the armed forces for civilian service without impairment of the war effort; (2) the speed with which demobilization of medical personnel of the armed forces can be accomplished as the needs of the armed forces diminish; and (3) whether any further action is necessary to insure an adequate supply of trained medical personnel to meet the future needs of the armed forces and the civilian population of the nation.

Social Security Act

Senator Green, Rhode Island, has introduced S. 1188 to amend and extend the provisions of the Social Security Act so as to provide, among other things, hospitalization benefits and benefits for disabled workers. So far as the hospitalization provisions are concerned they are similar to those that were included in the bill introduced in the 77th Congress by Congressman Eliot, Massachusetts, which was analyzed in THE JOURNAL, Sept. 26, 1942, page 296.

Veterans Administration

The appointment of an advisory committee by the President to advise him and the Administrator of Veterans' Affairs with respect to the formulation and administration of programs for providing hospitalization and medical care to veterans is proposed by S. 1187, introduced by Senator White, Maine, for Senator Shipstead, Minnesota. It is contemplated that members of this advisory committee shall be outstanding persons in the professions of medicine, surgery, dentistry, hospital administration and nursing.

Two bills propose a liberalization and clarification of the laws pertaining to hospital treatment, medical care, domiciliary care and related services for veterans, S. 1203, introduced by Senator Johnson, Colorado, and H. R. 3522, introduced by Representative Rankin, Mississippi.

A bill introduced by Representative Rogers, Florida, H. R. 3594, would authorize the Administrator of Veterans' Affairs to reimburse any accredited hospital for hospitalization and treatment, for a period not exceeding ten days, of a veteran where such hospitalization and treatment was of an emergency character.

H. R. 3629, introduced by Representative Maloney, Louisiana, proposes an appropriation of $2,500,000 to erect a general medical and surgical hospital and domiciliary facility in or near New Orleans for the care and treatment of women veterans.

The term "Veterans Administration facilities" would be redefined by a bill introduced by Representative Sikes, Florida, H. R. 3630, to include any private hospital or institution for which the Administrator of Veterans' Affairs may deem it necessary and proper to contract in order to provide hospital care for veterans suffering from injuries and diseases.

Miscellaneous

Representative Priest, Tennessee, has introduced H. R. 3561, proposing to amend the Public Health Service Act to authorize grants to the states for surveying their hospitals and public health centers and for planning construction of additional facilities, and authorize grants to assist in such construction. This bill is substantially the same as the Hill-Burton Hospital Construction Bill, S. 191.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

New Secretary of Medical Board.—Dr. Leonce J. Kosminsky, Texarkana, has recently been elected secretary of the state medical board of the Arkansas Medical Society, succeeding Dr. De Veaux L. Owens, Harrison.

CALIFORNIA

Student Awarded Gold Headed Cane.—Dr. Guerne W. de Lappe, San Francisco, was awarded the gold headed cane given each year to a member of the graduating class of the University of California Medical School, San Francisco. According to the University of California Clip Sheet, the award of the cane is an old English custom which was revived in 1939 by Dr. William J. Kerr, professor of medicine. Each year he presents a cane to the senior medical student who, in the opinion of his classmates and the faculty of the division of medicine, has demonstrated the most striking qualities of a true physician. Dr. David J. New, Piedmont, formerly of Monrovia, received first honorable mention and Dr. Jack Donald Thorburn, El Segundo, second honorable mention.

X-Ray Survey Center Planned.—A mass x-ray survey plan, calling for the establishment of a permanent x-ray survey center open to the public five days a week, has been unanimously approved by the board of directors of the Sacramento County Tuberculosis and Health Association. The plan will make it possible to offer free x-rays to every family in the city and county in the next two years. An estimated 500 families daily will be sent direct invitations by mail giving them specific appointments for x-ray examination, these to be sent after the mailing of literature explaining the purpose of the county wide program and a summary of the tuberculosis problem in the area. It is hoped to have the plan in full operation by fall, according to the *Bulletin* of the National Tuberculosis Association.

ILLINOIS

District Meeting.—Dr. Glen W. Doolen, Davenport, Iowa, was elected president of the Iowa-Illinois Central District Medical Association at its annual meeting on May 24, succeeding Dr. Paul P. Youngberg, Moline. Other officers include Drs. Joseph K. Hanson, Moline, vice president; James Dunn, Davenport, secretary, and Florens E. Bollaert, East Moline, treasurer. Among the speakers at the meeting were Dr. James L. Mudd, St. Louis, on "Empyema" and Dr. Herbert E. Schmitz, Chicago, "Management of Prolonged Labor." Dr. Andrew C. Ivy, Chicago, addressed the dinner session on "Some Contributions of Medicine to Survival on a Raft at Sea."

Chicago

Personal.—Horace L. Sipple, Ph.D., formerly associated with the American Can Company, has been appointed director of the research and educational program of the Evaporated Milk Association.

Special Society Election.—Dr. Frederick R. Schmidt was recently chosen president of the Chicago Dermatological Society. Other officers include Dr. Maurice J. Reuter, Milwaukee, vice president, and Dr. Marcus R. Caro, secretary-treasurer.

Pigeons to Be Tested for Pneumonia Virus.—Itinerant pigeons in Chicago will be tested in the city laboratories of the state department of health to determine if they are carriers of a virus type pneumonia, the Chicago *Sun* reported June 21. Similar tests made at the University of California on pigeons taken from the streets of Philadelphia resulted June 20 in an order by the Philadelphia Department of Health for extermination of the pigeons in the squares and parks, the *Sun* stated. The tests disclosed that 45 per cent of the birds carried a virus which is said to resemble psittacosis. Two tests will be made to identify the virus—one a test of the pigeon serum for the presence of antibodies, and the other to isolate the virus in the pigeon tissue. Recent pigeon tests made in Detroit revealed antibodies in the pigeon serum.

Cancer Committee Opens Information Bureau.—The Chicago Cancer Committee announces the opening of the cancer information bureau at 139 North Clark Street, where facts concerning cancer control and information about facilities for the diagnosis and treatment of cancer will be made available to the public. The bureau is being established in cooperation with the Field Army of the American Cancer Society. Dr. George E. Wakerlin is chairman of the Chicago Cancer Committee, which was organized in 1941 under the leadership of Dr. Ludvig Hektoen to coordinate the activities of all groups engaged in cancer control work in the Chicago area, to encourage research and education of the public and to assist in the establishment of diagnostic and treatment facilities. Dr. Hamilton R. Fishback is chairman of the committee of the information bureau.

INDIANA

Personal.—Dr. John A. Davis, Flat Rock, was chosen president of the Indiana Tuberculosis Association at its meeting in Indianapolis May 9, succeeding Dr. James F. Spigler, Terre Haute.

License Revoked.—The state board of medical registration and examination on March 27 revoked the license to practice medicine of Dr. Frank Morse Nichols, Warsaw and Winona Lake, because of a narcotic conviction.

New Diagnostic Treatment Building.—On June 10 a new diagnostic treatment building was opened at Clearview, Evansville, which expands the bed capacity from 16 to 32. The building cost $55,000. Speakers at the opening included Dr. Clarence C. Herzer, president of the Vanderburgh County Medical Society, and Congressman Charles M. LaFollette. Clearview is a private hospital for patients suffering from mental and nervous disease, alcoholism or drug addiction. Dr. Albert L. Crane is one of the owners and physician in charge.

Members of Hospital Regulation and Licensing Council.—Members of the newly created hospital regulation and licensing council of the Indiana State Board of Health, appointed recently by the governor, are:

Dr. Eldo H. M. Clauser, chairman, Muncie.
Mr. Albert G. Hahn, vice chairman, Protestant-Deaconess Hospital, Evansville.
Sister Amelia, R.N., St. Elizabeth Hospital, Lafayette.
Dr. David R. Johns, East Chicago.
Olive M. Murphy, R.N., Bartholomew County Hospital, Columbus.
Dr. Benjamin P. Linvill, Columbia City.
Mr. J. B. H. Martin, administrator, Indiana University Medical Center, Indianapolis.

Ex officio members are Mr. Otto F. Walls, director, state department of public welfare, Indianapolis, and Dr. Thurman B. Rice, secretary of the state board of health, Indianapolis, who after July 1 was to be succeeded by Dr. Leroy E. Burney, New Orleans, recently named state health commissioner. The council was set up by the 1945 legislature with authority to license, inspect and regulate hospitals.

MARYLAND

Twenty-Fifth Conference of State Board of Health.—The Maryland State Department of Health recently held its twenty-fifth annual conference in Baltimore. Sessions were held at the Johns Hopkins School of Hygiene and Public Health and at the state department of health. Among the speakers were:

Dr. Charles H. Halliday, Baltimore, Tuberculosis Control in Maryland.
Dr. Edwin L. Crosby Jr., Baltimore, Importance of Hospital Licensing.
Dr. G. Foard McGinnes, St. Louis, The Blood and Blood Derivaties Program of the American Red Cross.
Dr. Myron E. Wegman, New York, Indices of Nutrition.
A. W. Hedrich, Sc.D., Baltimore, Role of the Public Health Nurse in Promoting Birth Registration.

MASSACHUSETTS

University News.—Dr. Lewis H. Weed, Baltimore, chairman of the division of medical sciences of the National Research Council, gave the commencement address at Boston University School of Medicine, June 22, on "Some Aspects of Medicine in the Years Ahead."

Alonzo K. Paine Given Distinguished Service Key.—On June 16 Dr. Alonzo K. Paine was awarded a distinguished service key by the trustees of Tufts College in recognition of exceptionally loyal service to his alma mater, Tufts College Medical School. This recognition is made to a small group of individuals each year and is a joint award of the alumni association and the trustees of the college. As president of the Tufts Medical Alumni Association Dr. Paine has been responsible for organizing and completing the drive for funds for a new medical school building, to be erected at the New England Medical Center.

MICHIGAN

Changes in Health Officers.—Dr. Verne L. Van Duzen, Belding, has been appointed director of health for the Mecosta-Osceola health department, effective June 1. Dr. Ira O. Church, Coldwater, has resigned as director of the Branch County Health Department. Dr. James J. Croley, Houghton, has been appointed director of health of Kalamazoo County.

State Health Department Creates New Peninsula Office.—Dr. Wilbert J. M. Menke, a member of the teaching staff of the University of Michigan School of Public Health and of the school of medicine, has been appointed director by the state health commissioner of the upper peninsula office of the Michigan Department of Health. The new office was created by the 1945 legislature and will have offices at the Pinecrest Sanatorium, Powers. *Michigan Public Health* reports that the new office was established to make possible a more effective public health program in the upper peninsula. The thirteen county health departments in the upper peninsula have operated in the past without the immediate assistance and supervision of the state health department. They have been isolated from the central office in Lansing by distance and from one another by a lack of coordinating supervision. Two counties do not have health departments.

MINNESOTA

State Medical Election.—Dr. Edwin J. Simons, Swanville, was elected president of the Minnesota State Medical Association at the meeting of the house of delegates in St. Paul May 19-20. He will succeed Dr. Edward L. Tuohy, Duluth, on Jan. 1, 1946. Other officers chosen include Drs. Max Alberts, St. Paul (deceased) and Winslow C. Chambers, Blue Earth, vice presidents; Benjamin B. Souster, St. Paul, secretary and William H. Condit, Minneapolis, treasurer. The house of delegates formed a nonprofit corporation which will be independent of the state medical association but whose board of directors will be made up of two physicians from each of the nine councilor districts and three at large. The first meeting was to be held June 17, according to the state medical journal. The journal also announced that the committee on sickness insurance of the state association has changed its name to the committee on medical care. At the time of this report it was not yet decided whether the medical service plan to be promulgated by the corporation was to be coordinated with the Blue Cross.

MISSOURI

Pilgrimage to Beaumont's Grave.—The Lloyd R. Boutwell Post, No. 136, American Legion, held memorial services at the grave of Dr. William Beaumont at the Bellefontaine Cemetery, St. Louis, May 30. This is an annual service of the Boutwell Post.

Personal.—Dr. Edward W. Cline, Platte City, health officer of Platte County, has been appointed to a similar position in charge of the newly merged city-county health department of Jasper County with offices in Joplin.——Dr. George A. Mellies was guest of honor at a dinner May 31 given by the staff of the Christian Hospital, St. Louis, in recognition of his completion of fifty years in the practice of medicine. He was presented with a wrist watch.

MONTANA

Board Election.—Dr. Cedric H. Nelson, Billings, was elected president of the state board of medical examiners April 2 in Helena, Dr. Edmund A. Welden, Lewistown, was chosen vice president and Dr. Otto G. Klein, Helena, was reelected secretary. Dr. Patrick E. Kane, Butte, was reappointed a member of the board for a seven year term.

Health League Takes Permanent Offices.—The Public Health League of Montana has established permanent offices in the Power Block, Helena. All communications should be addressed to Post Office Drawer 1142, Helena. The league will serve as a clearing house for public relations activities of various affiliated groups, aid in conducting programs of information regarding affairs and activities which affect public health, cooperate with existing public health agencies and protect the interests of the public through health campaigns, crusades and other activities. Mrs. H. W. Peterson, Billings, field commander, northwest region, Field Army, American Cancer Society, is president of the organization; Rev. Frank L. Harrington, Butte, representing the Catholic Hospital Association, is vice president; Milo F. Dean, Great Falls, representing the Montana Hospital Association, is secretary-treasurer. D. W. Bowler, Helena, has been selected league manager and Margaret Applegate, Helena, office secretary. In addition to Father Harrington, Mr. Dean and Mrs. Peterson, the directors of the league include Dr. James M. Flinn, Helena, Montana Medical Association; Mrs. Frances MacDonald, Great Falls, Montana State Nurses Association; E. A. Kuntz, Helena, Montana Optometric Association; Joe L. Markham, Butte, director at large; George Gosman, Dillon, pharmaceutical association; Harvey Fearn, Bozeman, Montana State Dental Association, and George Hutton, Billings, tuberculosis association.

NEW YORK

Ninety-Four Years of Age.—Dr. Frederick N. Winans, Franklin, celebrated his ninety-fourth birthday May 28. He practiced in Gilbertsville for twenty years and has been in Franklin fifty-one years.

Progress of Plan for Distribution of Blood Plasma.—Provisional plans for the organization of a statewide program to distribute blood plasma and blood derivatives in New York State have been drawn up by the state department of health, through its office of medical administration and division of laboratories and research, in collaboration with the New York State Association of Public Health Laboratories, the state hospital association and the Medical Society of the State of New York. The general distribution will be made through approved public health laboratories for the purpose of establishing a supply for the smaller urban and rural communities. While no charge will be made for the plasma, it is expected that individuals benefiting from its use will be made responsible for obtaining donors who will give blood for its replacement. According to *Health News*, other features of the projected service are the establishment of a center of information as to where blood of unusual types may be obtained on short notice and encouragement of the use of standardized equipment in all cooperating laboratories, making possible an interchange of facilities in emergencies. Of particular importance is the anticipated promotion of a continued graduate medical program, in cooperation with the state and county medical societies, which will provide information concerning the value and use of whole blood and its derivatives. The proposed program is being developed as a result of the passage of enabling legislation and an appropriation by the legislature of $100,000.

New York City

License Reinstated.—The license to practice medicine of Dr. Herman L. Kasha, revoked in 1941, was reinstated as of July 1.

Personal.—Philip S. Platt, Ph.D., executive director of the New York Association for the Blind, was chosen president of the Greater New York Council of Agencies for the Blind at its annual meeting, June 5. Berthold Lowenfeld, director of educational research, American Foundation for the Blind, was elected secretary-treasurer.

Dr. Freitag Surrenders.—Dr. Abraham Freitag, Brooklyn, who pleaded guilty recently to charges of diverting to the black market bandage material for which he had a priority, surrendered June 18 to U. S. Marshal James E. Mulcahy to begin a prison term of three years. He was also fined $100,000, which had not been paid at the time of this report (THE JOURNAL, June 16, p. 532).

Physician Receives Anniversary Volume.—Dr. Eli Moschowitz, consulting physician of the Mount Sinai Hospital, was presented June 27 with a special edition of the *Journal of the Mount Sinai Hospital* in commemoration of his recent sixty-fifth birthday. Dr. Moschowitz graduated at Columbia University College of Physicians and Surgeons in 1900 and served his internship at Mount Sinai. In 1920 he joined the staff of the medical service; in 1941 he was named attending physician and in 1944 consultant.

NORTH CAROLINA

Honor Physicians Over Seventy.—Nine Mecklenburg County physicians, seven of them more than 70 years old and the others to be 70 in September, were honored by the Mecklenburg County Medical Society at a dinner dance in Charlotte June 1. The physicians who are already 70 or more are Drs. Robert L. Gibbon, Albert M. Whisnant, Calvin S. McLaughlin, James G. Johnston, Thomas M. McCoy and James R. Alexander, all of Charlotte, and Thomas N. Reid, Matthews. The other two are Drs. Lorenzo D. McPhail and William M. Strong, both of Charlotte.

Southern Pediatric Seminar.—The twenty-fifth session of the Southern Pediatric Seminar will be held at Saluda, July 16-28. Among the speakers will be:

Dr. Samuel F. Ravenel, Greensboro.
Dr. Frank H. Richardson, Black Mountain.
Dr. Owen H. Wilson, Nashville, Tenn.
Dr. William L. Funkhouser, Atlanta.
Dr. Charles J. Bloom, New Orleans.
Dr. John LaBruce Ward, Asheville.
Dr. Francis B. Johnson, Charleston, S. C.
Dr. William Weston, Columbia, S. C.
Dr. Daniel Lesesne Smith, Saluda.
Dr. W. Ambrose McGee, Richmond, Va.
Dr. Angus M. McBryde, Durham.
Dr. Alfred A. Walker, Birmingham, Ala.
Dr. Richard M. Pollitzer, Greenville, S. C.
Dr. Stewart H. Welch, Birmingham.
Dr. Wilburt C. Davison, Durham.
Dr. Oren Moore, Charlotte.
Dr. Oscar L. Miller, Charlotte.
Dr. Antonio J. Waring, Savannah, Ga.
Dr. Kenneth M. Lynch, Charleston.
Charles B. Bray, D.D.S., Birmingham.
Dr. Joseph Warren White, Greenville, S. C.
Dr. Hamilton W. McKay, Charlotte.
Dr. Robert W. McKay, Charlotte.
Dr. Philip A. Mulherin, Augusta, Ga.
Dr. Luther W. Holloway, Jacksonville, Fla.
Dr. Warren W. Quillian, Miami, Fla.
Dr. Madison Hines Roberts, Atlanta.
Dr. Mylnor W. Beach, Charleston, S. C.
Dr. Daniel Lesesne Smith Jr., Spartanburg, S. C.
Dr. Julian P. Price, Florence, S. C.
Dr. Frank Lee Bivings, Atlanta.
Dr. Jay M. Arena, Durham.
Dr. Robert B. Lawson, Winston-Salem.
Dr. Hughes Kennedy Jr., Birmingham.
Dr. Amos Christie, Nashville.

The participants will present papers, conduct clinics and hold various round table discussions. Dr. Daniel Lesesne Smith, Saluda, is registrar for the seminar.

OKLAHOMA

Paul Fesler Returns to University.—Mr. Paul H. Fesler has resigned as executive secretary of the Oklahoma State Medical Association to return to the University of Oklahoma School of Medicine, Oklahoma City, as administrator of hospitals. Mr. Fesler will continue with the state medical association on a part time basis pending the appointment of a successor.

Physician's Library Given to County Medical Society.—The medical library of the late Dr. John Frederick Bolton, consisting of about 100 volumes, has been transferred to the library of the Tulsa County Medical Society through the courtesy of St. John's Hospital, Tulsa. It will be placed in the special section to be indicated by a bronze plaque, presented to the medical library by Dr. Bolton's family. The *Bulletin* of the Tulsa County Medical Society announces that members of the Bolton family plan to keep the library active through the years by the addition of new textbooks.

PENNSYLVANIA

Personal.—Dr. Edward M. Iland, Coraopolis, has been appointed district medical director for Allegheny County, in the absence of Dr. Angelo M. Williams, Pittsburgh, who is in military service.——Dr. John Webb Vaughn, Bergery, was guest of honor at a dinner, May 10, in recognition of his completion of fifty years in the practice of medicine.

Survey of the Blind.—Miss Annette Dinsmore, field supervisor of the home instructors for the adult blind, Pennsylvania Council for the Blind in the state department of welfare, is securing some data in regard to deaf-blind persons in Pennsylvania. Her work is a part of the program of the American Foundation for the Blind to secure as much data as possible on a representative sampling of deaf-blind persons in order to assist in determining their greatest needs. P. C. Potts, assistant director, American Foundation for the Blind, New York, is planning to devote considerable time to the problem.

Philadelphia

Dr. Ingleby Resigns as Professor of Pathology.—Dr. Helen Ingleby, since 1924 professor of pathology at Woman's Medical College of Pennsylvania, resigned June 15 to head on a full time basis the division of pathology in the laboratories of the Jewish Hospital.

New Professorship in Ophthalmology.—On June 16 the University of Pennsylvania received a gift of $155,000 from the estate of the late Dr. George E. de Schweinitz, who died Aug. 22, 1938. According to the New York *Times*, the bequest will be used to establish a fund to support the department of ophthalmology and to create a professorship to be known as the "William F. Norris and George E. de Schweinitz Professorship of Ophthalmology." Dr. Norris was the first professor of ophthalmology at the medical school and Dr. de Schweinitz was professor from 1902 until 1929, when he became emeritus professor.

Special Society Election.—Dr. Gerald H. J. Pearson was chosen president of the Philadelphia Psychoanalytic Society at its annual meeting June 9. Other officers include Drs. George W. Smeltz, Pittsburgh, vice president, and LeRoy M. A. Maeder secretary-treasurer.

The Jarecki Lecture.—Dr. Harry C. Solomon, professor of psychiatry at Harvard Medical School, Boston, and head of the department at the Boston Psychopathic Hospital, delivered the eleventh annual Jarecki Memorial Lecture at the Jewish Hospital, May 2, on "The Effects of War on Psychiatry."

Pittsburgh

Medical Bulletin Dedicated to Women Members.—The *Pittsburgh Medical Bulletin* for June 2 was dedicated to the 58 women members of the Allegheny County Medical Society. Dr. Zoe Allison Johnston, elected in 1944, was the first woman to be chosen president of the society.

TENNESSEE

Personal.—William Henry Hollinshead, Ph.D., associate professor of anatomy at the Duke University School of Medicine, Durham, N. C., will be visiting associate of anatomy at the University of Tennessee College of Medicine, Memphis, during the summer quarter, according to *Science*.——Dr. Julian E. Williams, Blountville, recently resigned as health officer of Sullivan County.——Dr. John W. Shackelford has been appointed assistant health officer of the Memphis and Shelby County Health Department, succeeding Dr. W. D. Burkhalter (THE JOURNAL, May 12, p. 146).

UTAH

Personal.—Dr. Thomas J. Howells on May 18 was named director of the Salt Lake County Health Department. Dr. Howells has served as superintendent of the Salt Lake County General Hospital and also as health commissioner of Salt Lake City.——Dr. Edward L. Van Aelstyn, Price, has resigned as health officer of district number 3, including Carbon, Emery, Grand and San Juan counties, effective June 1, to enter private practice.

WASHINGTON

Physicians Sue Medical Society.—Drs. John M. Howell and Roy H. Blender, Renton, are said to have filed a suit in Superior Court against the King County Medical Society "to force the society to permit them to practice in the new Renton Hospital" according to the Seattle *Times*, May 25. The use of the hospital was said to be denied the physicians because they were not members of the society, it was stated. The King County Medical Service Corporation was also named a defendant in the suit. The plaintiffs accused the society of conspiring with the medical service corporation to acquire a "monopoly" for members of the society in practicing medicine in the county. It was said that the corporation and the society also were charged with conspiring to "eliminate competition" in furnishing medical and hospital services to the public on the prepayment or monthly payment plan. Others named as defendants include the Valley Hospital Foundation, which operates Renton Hospital; Dr. Harold E. Nichols, Seattle, president, and other officers and trustees of the society; Dr. Erroll W. Rawson, Seattle, who was identified as president of the medical service corporation but who no longer holds that office; Dr. Karl H. Van Norman, superintendent of Doctors Hospital, Seattle, and officers and trustees of the Valley Hospital Foundation. Dr. Howell and Dr. Blender are affiliated with the Medical Security Clinic, which has offices in Seattle, Renton, Kirkland, Winslow and Ravensdale.

WEST VIRGINIA

Tumor Clinic Formed.—A tumor clinic has been organized in Fairmont under the joint sponsorship of the Marion County Medical Society and the county health department. Nursing service and follow-up work is being provided by the personnel of the health department. The clinic will be held on the first and third Thursdays of each month.

Changes in Health Officers.—Dr. Elias W. Langs, U. S. Public Health Service Reserve, acting director of the division of communicable diseases, state health department (THE JOURNAL, January 27, p. 238), has been appointed health officer of Kanawha County, succeeding Dr. Albert M. Price, who

resigned some months ago and is now engaged in private practice in Charleston. Dr. Thomas E. Romine, Charleston, who has been acting county health officer, has been named assistant to Dr. Langs.

HAWAII

Territorial Election.—Dr. Eric A. Fennel, Honolulu, was reelected president of the Hawaii Territorial Medical Association at its annual meeting in May. Other officers include Drs. Louis A. R. Gaspar Jr., secretary, and Lyle G. Phillips, treasurer, both of Honolulu. Dr. Arthur Gordon Hodgins, Honolulu, was named president emeritus of the association.

Society News.—A recent meeting of the Honolulu County Medical Society was addressed by the following:

Dr. Martin H. Lichter, Critical Analysis of Medical Economic Problems in Hawaii.
Dr. Harold M. Patterson, Aims and Aspirations of the Territorial Association of Plantation Physicians.
Lieut. Col. Herman L. Meltzer, M. C., Some of the Medical Lessons Learned in World War II—Army.
Comdr. Albert W. Hobby (MC), Some of the Medical Lessons Learned in World War II—Navy.
Capt. Howard K. Gray (MC), Some of the Surgical Lessons Learned in World War II—Navy.
Col. Forrester Raine, M. C., Some of the Surgical Lessons Learned in World War II—Army.

Health Committee to Broaden Activities.—The chamber of commerce of Honolulu in May approved a plan for streamlining and broadening the scope of activities of its public health committee. According to the Honolulu *Advertiser*, Dr. Forrest J. Pinkerton, Honolulu, chairman of the committee, announced that as a result of the adoption of his reorganization plan the former Oahu health council, representing all social service and related health groups, would be reactivated, permitting virtually all public health activities to be coordinated through the relationship between the public health committee and other welfare and public health agencies. According to the new plan, certain ex officio members of the public health committee by virtue of their positions with other public health agencies will be discontinued and will have their representation through the Oahu health council. An advisory committee is to be organized from among the membership of the public health committee. Raymond G. Nebelung, new executive director of the health committee, is to be charged with coordination of the various groups, working under Dr. Pinkerton's direction, and a health specialist, Mrs. Allice Spillane, formerly with the Washington state health department, will be added to the staff.

GENERAL

Sir Alexander Fleming Tours United States.—Sir Alexander Fleming, London, discoverer of penicillin, is touring the United States as a representative of the British Ministry of Supply.

Pediatric Examinations to Be Held in Atlantic City.—The American Board of Pediatrics announces that the oral examination will be held in Atlantic City at the Hotel Claridge, December 7-9. This change was made because hotel reservations in New York were unavailable. The written examination of the board will be locally under a monitor, October 19.

Meetings Canceled.—The American Congress of Physical Medicine announced that its annual scientific and clinical session, scheduled to be held in New York, September 5-8, has been canceled. Marion G. Smith, B.Sc., 30 North Michigan Avenue, Chicago 2, is the executive secretary.——The annual convention of the American Academy of Ophthalmology and Otolaryngology which was scheduled for October has been canceled.

Medical Illustrators to Organize.—Twenty-five medical illustrators will meet at the University of Illinois College of Medicine, July 16-19, to create an association of medical illustrators. The session is the result of a two year study and speakers will include Dr. Morris Fishbein, Editor of THE JOURNAL; Dr. Eben J. Carey, Milwaukee; Dr. Malcolm T. MacEachern, Chicago; Thomas G. Hull, Ph.D., director scientific exhibit, American Medical Association, and Carl G. Hartman, Ph.D., Urbana, Ill. One session will be held at the Museum of Science and Industry, Jackson Park, Chicago.

Mental Hygiene Committee Comments on Psychiatric Facilities for Discharged Veterans.—On June 22 the National Committee for Mental Hygiene issued a statement through the United Press that figures recently made available "reveal a staggering need for the creation of psychiatric facilities for the care of mentally disabled veterans." This need was emphasized as a result of the estimate that 500,000 veterans had been discharged from the services for psychiatric reasons by the end of 1944. Facilities are also needed to aid the 1,500,000 men rejected for service because of psychiatric reasons, it was stated. A survey showed twenty-five states without a community clinic for psychiatric care and "vast areas in other states where no psychiatric help is available." Of the total number of established hospitals and clinics throughout the country, only 139 certified their preparedness to treat mental casualties. "With the best will in the world the Veterans Administration and the state vocational rehabilitation bureaus cannot provide psychiatric treatment when neither clinics nor psychiatrists are available," the announcement said. It further reported that the estimated cost to the taxpayer was $30,000 for every hospitalized psychiatric casualty of World War I.

Government Services

Estella Warner Goes to Kansas City

Dr. Estella Ford Warner, senior surgeon, U. S. Public Health Service, district three, with headquarters in Chicago, has been transferred to district seven, with headquarters at Kansas City, Mo., and with the title medical director. The change is effective July 1.

Grants in Aid for Cancer

Nine grants in aid totaling $79,377 were approved at the twenty-eighth meeting of the National Advisory Cancer Council recently at the National Cancer Institute of the U. S. Public Health Service, Bethesda, Md. The total is the greatest amount ever granted at one time by the council and will be expended as follows:

Harvard University, Boston, $24,500 for the study of the relation of steroid hormones to growth and tumors under direction of Dr. James H. Means. Drs. Fuller Albright and Joseph C. Aub will also participate.

Mount Sinai Hospital, New York, $10,775 for clinical studies on gastric cancer under the direction of Franklin Hollander, Ph.D.

Harvard University, an additional $10,000 for the study of the pathology of cancer of the stomach, peptic ulcer and gastritis, with Dr. Shields Warren in charge.

University of Cincinnati, Cincinnati, $10,000 for clinical studies of gastric cancer to be conducted by Dr. Leon Schiff.

Northwestern University, Chicago, $8,500 for research in cancer education. Dr. Andrew C. Ivy will supervise the work.

Haskins Laboratories, New York, $5,000 research on the virus-like agent in mammary cancer of mice. Paul A. Zahl, Ph.D., will direct.

Detroit Institute of Cancer Research, Detroit, $6,152 for study in relation of certain types of diets to induced cancer in rats with Wilhelmina F. Dunning, Ph.D., in charge.

New York University, New York, $3,000 in a study of Hodgkins disease by Robert Chambers, Ph.D.

University of Minnesota, Minneapolis, $1,450 studies on leukemia in mice, conducted by Dr. Arthur Kirschbaum.

Urge Expansion of Services for Children

A recommendation has been presented to President Truman for immediate expansion of health, welfare, education and other federal-state services for children with an additional $75,000,000 appropriation for the fiscal year 1946. The recommendation was made at the conclusion of a year's study by the National Commission on Children in Wartime, according to the New York *Times*. A $50,000,000 addition to the current $6,000,000 grants-in-aid appropriation to the states for maternal and child health services was recommended, this sum to be broken down into a $10,000,000 dental care program for young children, a $15,000,000 school health program and a $25,000,000 program for the care of mothers, infants and preschool children. A $25,000,000 increase over the less than $4,000,000 in current yearly grants for crippled children's services was asked, $15,000,000 of which would go to the victims of rheumatic fever and heart disease, which kill and cripple more grade school children than any other cause except accidents; the rest to be divided equally between orthopedic and other types of crippling such as diabetes, allergies and epilepsy. The *Times* states that the period of ten years was set as the logical limit on providing through federal and state funds such all inclusive service. It was recommended that after the fiscal year 1946 no maximum be specified for either maternal and child health or crippled children's services. Within the same ten years, the commission contended, this nation should provide child welfare services reaching into every county of every state and should have greatly expanded the community resources for care of children of employed mothers, for foster care for dependent children, for detention care of children who come before juvenile courts and for return of child waifs and runaways to their own communities.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 2, 1945.

The Problem of Medical Demobilization

The termination of the war in Europe does not promise much relief in the near future of the shortage of doctors in civil practice. In a letter to the *Times* Lord Moran, president of the Royal College of Physicians, says that they have fallen below the margin of safety. There is 1 general practitioner for 2,640 people in this country, while there is 1 for 350 men in the army. On the invitation of the director general of the Army Medical Service Lord Moran was able, with the registrar of the college and Prof. L. S. P. Davidson, to go to Belgium, the Netherlands and Germany to talk over problems of demobilization with medical officers in the army. They were able to hold ten meetings and to have many informal discussions with more than 1,000 medical officers. Many of these men had not seen their families for five years. They had been disturbed by the report that the release of doctors would not keep pace with general demobilization. The trouble is that the army medical authorities are still uncertain of their commitments in the war with Japan. They reckon that for every doctor required for a given force in Europe 3 doctors will be required in the Far East on account of the long lines of communication, wastage from tropical diseases and the lack of civil hospitals at the base, such as are provided in England. Meanwhile the army in Europe is saddled with responsibility not only for the soldiers but for the civilians of many nations. Only a third of the beds in military hospitals in Italy are occupied by British soldiers. Of 211,813 soldiers admitted to military hospitals in the Middle East in 1944 only 87,157 were British. Nevertheless, the army medical authorities have determined to solve this problem of demobilization and have set about ruthlessly cutting down establishments except in the Far East. They believe that they can release most of the general duty officers without replacement by men from general practice.

The position of specialists is less happy. In the first eleven demobilization groups there are 1,431 doctors, of whom 467 are specialists. The army contends that some of the latter can be released only if they are replaced by specialists not now in the army. However, it is hoped that the vast majority of both general practitioners and specialists in the first eleven groups will be demobilized by autumn.

The Central Medical War Committee (a medical body which controls medical recruiting) announces that doctors will be released from the armed forces in groups, determined by age and length of service. These releases will be possible partly owing to reduction in strength of the forces but partly also as a result of continued recruitment. One of the objects of the latter is to increase the releases. Arrangements will be made to transfer to civilian employment, out of their turn and with their consent, a limited number of doctors who are urgently required for work of national importance. They will be liable to recall to the forces if they leave the work for which they are transferred. It seems that at present little can be done to relieve the shortage of doctors in civilian practice. Indeed, every man and woman who can be spared is being sent to the forces. The main source of supply is a pool of young practitioners who have completed posts at hospitals. These are rarely allowed to accept even short term engagements in general practice, although urgent appeals for their services as assistants are made. Also they are not granted deferment to enable them to take examinations for higher degrees. Many civilian doctors are carrying intolerable burdens.

Arrangements have been made for the postgraduate training of doctors leaving the services. Those who joined within a year or so of qualifying are offered paid posts in hospitals. Those who were established in general practice before joining are offered a refresher course free of cost with traveling expenses paid and a subsistence allowance. For medical officers who were training for a specialist career before joining or are regarded as suitable for such training, paid posts of the "registrar" type in teaching and other hospitals will be provided.

Hospital Services in London and the Surrounding Area Inadequate

In 1941 the minister of health commissioned two physicians, Dr. A. H. M. Gray and Dr. Andrew Topping, to report on hospital services in London and the surrounding area and to make recommendations. Their report, which has just been published, shows that no adequate and comprehensive hospital service is attainable without considerable give and take on the part of both the local authorities and the voluntary hospitals. The most urgent and the most important single improvement would be in the medical staffing of hospitals. To make the best use of the specialists available, decentralization from London is urged with their appointment at the principal hospitals, termed "district hospitals," in the surrounding area. Payment for their services should be on a scale which will adequately repay them for breaking their ties in London. In quantity or in quality, or in both, accommodation is found deficient in every area. A large building program is needed to raise the standard to an adequate level.

The Promotion of Sociability at the Royal College of Surgeons

The council of Royal College of Surgeons has decided to institute monthly subscription dinners in the college for fellows and members of the college and members of the specialist associations linked with it. These will be held on the evening of the Wednesday preceding the second Thursday of the month. Applications must be made to the secretary at least a week before the date of the dinner accompanied by a payment of $4, the inclusive charge for each dinner. The council's object is to give those associated with the college opportunities of meeting socially more often. If it is found that the opportunity for dining in the college is properly appreciated, arrangements will be made to hold these dinners at shorter intervals. In the plans for the restoration and development of the college after the war damage it is intended that facilities for lunching and dining shall be greatly increased.

Low Mortality of American Wounded Treated in Britain

The medical department at the headquarters of the base in Britain of the United States Army has just stated that nearly 500,000 wounded American soldiers, the equivalent of some thirty divisions, have been evacuated from the continent of Europe since D day to United States medical installations in Britain. On February 8 casualties numbering 129,500 were in hospitals in Britain, which represented the peak number under care at any one time. There were ninety-nine hospitals and five big convalescent camps. The mortality among the patients was 0.26 per cent of total admissions. Approximately 61 per cent of all patients were returned to duty.

Belgian Visitors

A third group of Belgian professors is now visiting universities and research institutions in this country at the invitation of the British council. They include A. E. Michotte van den Berck, professor of experimental pathology at Louvain, A. E. Gratia, professor of parasitology and bacteriology at Liége, and J. A. H. Rodhain, director of the Institute of Tropical Medicine in Antwerp. The visit will last a fortnight.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, May 18, 1945.

Pharmacologic Study of a Curare-like Alkaloid

The therapeutic importance of curare is somewhat hindered by the disadvantages of its being difficult to obtain and of presenting a great variability of its pharmacologic properties; hence the reason why several investigators have in recent years proposed the use of some alkaloids with curare-like properties but easier to obtain and pharmacologically more constant, such as erythroidin hydrochloride, extracted from the seeds of Erythrina americana by Burman in 1940, or the synthesized alkaloid quinine methylhydrochloride, prepared by Harvey in 1940 and used by Bennett in 1941 in several clinical cases. Drs. Oswaldo V. Brazil, Roched A. Seba and J. S. Campos of the Instituto Vital Brazil of Niteroi, state of Rio de Janeiro, have published the first report of a series of systematic investigations on plants of the Amazon valley that could be used instead of curare. The report presents the results of the pharmacologic study of Chondrodendron platyphyllum, a plant of the Menispermaceae family abundantly found in that region of Brazil.

The watery extract of the plant and the alkali insoluble alkaloid from it possess the paralyzing activity, though of less potency than that of curare. The action also differs because this drug does not cause a previous stage of excitation in dogs, is more active when introduced intravenously and produces sudden muscular shocks in the posterior limbs of mice during the preagonic stage. The methylation of this alkali insoluble alkaloid increases its activity more than ten times on mice, rats and pigeons, making the methylated fraction more powerful than the majority of the samples of curare. Experiments performed on rats have proved that the action of the Chondrodendron methylated alkaloid is typically peripheral. The antagonistic action of neostigmine, which could prevent the death of the animals that had received two minimum lethal doses of either curare or the methylated alkaloid, suggested that the drug does not cause intense collateral toxic action on the circulatory system. The comparison between the minimum lethal dose for the mouse, the rat and the pigeon, of the curare sample used, of the watery extract of Chondrodendron, of its alkali insoluble alkaloid and of a methylated fraction of the latter showed a great difference of sensibility of the several kinds of animals to the various curarizing substances.

Intestinal Tuberculosis

Dr. José Feldman of the department of pathology of the University of Belo Horizonte, state of Minas Gerais, has recently published a paper in which he reports the results of the last 443 necropsies performed at that department with the aim of ascertaining the frequency of intestinal tuberculosis. Of the total of 443 necropsies, tuberculosis of all forms was present in 88 cases, or 19.8 per cent, with the following distribution of localization: respiratory system alone 28, respiratory and digestive systems 45, respiratory and other systems except the digestive 5, digestive system alone 6, and organs or systems other than respiratory and digestive 4. In 29 cases the disease was present under the form of generalized miliary tuberculosis, of which the respiratory and digestive systems were involved in 29 cases (100 per cent), the spleen in 21 cases, both kidneys in 10, the pericardium in 5, the meninges in 4, the tonsils in 3, the larynx in 1, the trachea in 2, the cerebrum in 1, the urethra and urinary bladder in 1 and the feminine genitalia in 5. In 12 of the cases of miliary tuberculosis the liver showed specific lesions without involvement of the gastrointestinal tract. The distribution of the tuberculous lesions in the different parts of the digestive system was esophagus 1, stomach 1, jejunum 2, ileum 15, cecum 11, colon 3, liver 25, peritoneum 18 and mesenteric lymph nodes 17.

Pulmonary Lavage for Diagnosis of Active Tuberculosis

Dr. Manoel De Abreu, a pioneer worker in the development of the miniature x-ray film for the mass detection of pulmonary tuberculosis, and also a distinguished practitioner of radiology at Rio de Janeiro, has just published a detailed description of his new method of pulmonary lavage for the diagnosis of pulmonary tuberculosis. Pulmonary (or bronchopulmonary) lavage consists essentially in the introduction of 40 cc. of isotonic solution of sodium chloride into the trachea through the intercricothyroid space ten minutes after a very slow injection of 10 cc. of a 0.5 per cent solution of a local anesthetic. After the introduction of the solution the patient's posture is slowly changed from upright to lateral, first to the right then to the left, and to a slight Trendelenburg position, to allow the various parts of the lungs to be in contact with the solution. The liquid is at last expelled through coughing and expectoration, the patient being in the genupectoral position. By this method the carriers and noncarriers of germs are definitely identified, and even the germ laden material discharged by each of the lungs can be ascertained. The technic causes little discomfort to the patient and is so simple and rapid that as many as ten or twenty examinations can be performed within a two hour period, if the proper equipment is at hand. The method is still in the experimental stage.

Brief Items

Drs. Luis Valverde Chinel and Vito Arce Reyeros, from Bolivia, arrived at Rio de Janeiro last month to follow a postgraduate course in bacteriology, parasitology and immunology at the Oswaldo Cruz Institute of Rio de Janeiro under fellowships awarded by the Division of Intellectual Cooperation of the Ministry of Foreign Affairs of Brazil. Dr. Reyeros is secretary general of the Bolivio-Brazilian Cultural Institute for the scientific interchange between the two countries.

Dr. J. C. Brassantini of Montevideo, Uruguay, now at Rio de Janeiro, was present at the last meeting of the National Academy of Medicine, where he read a paper on the roentgenologic diagnosis of pneumonia in the adult.

Marriages

ALBERT BENSEN VAN VRANKEN, Schenectady, N. Y., to Mrs. Mary Merriam Ross of Skaneateles in Syracuse, April 14.

STEWART INGLIS ADAM, West Collingswood, N. J., to Miss Phyllis Berrian Adams of Bedford Hills, N. Y., June 2.

JACK M. SIMMONS Jr., Denver, to Lieut. Anna Belle Longwater of Savannah, Ga., in Longview, Texas, recently.

HERBERT PECKOVER HARGETT, Maysville, Ky., to Miss Marion Hurlbut of Pelham Manor, N. Y., June 9.

NORBERT MENUHIN, Newark, N. Y., to Miss Marianne Grainer of Phelps in Rochester, May 27.

DAVID D. DEXTER, Richmond, Va., to Miss Edna Jane Nesbitt of Verona, N. J., and Richmond, June 9.

PAUL A. RIEMENSCHNEIDER, Cleveland, to Miss Mildred McCarthy of Manlius, N. Y., May 12.

JAMES R. ALLEN, Oakland, Calif., to Miss Lois Christine Armagost in Rochester, N. Y., June 2.

HARVEY CHADWICK PAULEY Jr., Belmont, Mass., to Miss Mildred Fraser of St. Louis, May 5.

ALDONA A. JUSKA, Oak Park, Ill., to Max R. Kennedy, D.D.S., in Nome, Alaska, April 19.

RONALD CLARE BISHOP, Almont, Mich., to Dr. Nancy Ventress Rider of Brooklyn, April 22.

PRESTON S. HOUK, Portland, Ind., to Miss Wilma Jean Curley in Detroit, April 7.

JAMES MATTHEW SAN to Miss Mary Alice Fisher, both of Durham, N. C., May. 10.

KENNETH J. KELLEY, Grove City, Minn., to Miss Viola Carter of Ada, April 2.

Deaths

Luther Halsey Reichelderfer ✠ Washington, D. C.; Columbian University Medical Department, Washington, D. C., 1899; formerly clinical professor of surgery at his alma mater, now known as the George Washington University School of Medicine; served as a member of the faculty of the Business High School, where he remained for four years as an instructor of mathematics; served as an intern at Garfield Hospital from 1899 to 1900 and was superintendent and chief resident physician from 1900 to 1907; medical director of the George Washington University Hospital, 1907-1908; member of the surgical staffs at Garfield, Children's and Tuberculosis hospitals until retirement from active practice in 1924; member of the consulting staffs of the Children's and Garfield hospitals; past president of the District of Columbia Commission on Licensure and the Medical Society of the District of Columbia; served as president of the board of commissioners of the District of Columbia; member of the Hippocrates-Galen Medical Society, Clinico-Pathological Society and the Association of Military Surgeons of the United States; one of the founders and life member of the American College of Surgeons; for many years an officer in the District of Columbia National Guard, serving as a first lieutenant and inspector of rifle practice, advancing to the rank of lieutenant colonel of infantry and chief surgeon; participated in a number of national rifle matches; during World War I was a lieutenant colonel in the medical corps of the U. S. Army in France; colonel, medical reserve corps, U. S. Army, not on active duty; since 1932 a member of the board of trustees of George Washington University, receiving the honorary doctor of laws from the university in the same year; died June 19, aged 71, of coronary occlusion.

Robert Hamilton Pierson ✠ Colonel, U. S. Army, retired, Cazenovia, N. Y.; Syracuse University College of Medicine, 1898; Army Medical School, 1903, School of the Line, 1920, Army War College in 1922; entered the U. S. Army in 1902; promoted through the various grades to that of colonel on Feb. 18, 1929; retired for disability in line of duty on Jan. 31, 1933; served at military posts throughout the United States, Cuba, Alaska, the Philippines and the Panama Canal Zone; during World War I was chief surgeon on the Fifth Division staff, later becoming chief surgeon of the Sixth and Seventh Army; after the armistice, remained in Germany with the Army of Occupation; on his return to the United States, assigned to the Philippine Islands and spent considerable time in China, Japan and India on special government assignments; later appointed chief surgeon at Fort Sill, Okla., after which he was transferred to New York to become inspector instructor in charge of medical teaching in the New York National Guard; held the Distinguished Service Medal and the Silver Star; died in the Memorial Hospital, Syracuse, June 2, aged 70, of cerebral hemorrhage and diabetes mellitus.

James Evans Stowers ✠ Kansas City, Mo.; Johns Hopkins University School of Medicine, Baltimore, 1913; specialist certified by the American Board of Surgery; member of the Western Surgical Association and the Kansas City Academy of Medicine; fellow of the American College of Surgeons; past president of the Kansas City Southwest Clinical Society and the Kansas City Surgical Society; chairman of the program committee of the Missouri State Medical Association; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; holder of the French Legion of Honor and the Croix de Guerre after four years of foreign service during World War I; on the consulting staff of the Ellis Fischel State Cancer Hospital, Columbia; on the staffs of St. Luke's Hospital, Kansas City General Hospital, Memorial Hospital, St. Joseph's Hospital and the Research Hospital, where he died April 30, aged 55, of coronary disease.

Joseph C. Dodds, Champaign, Ill.; Chicago Medical College, 1889; instrumental in founding and one of the original trustees of the Urbana and Champaign Sanitary District, serving on the board for many years; for many years a member and for ten years president of the Burnham Library board; for twelve years vice president of the Citizens State Bank; served on the staff of the State Hospital in Kankakee; district surgeon for the Illinois Central Railroad and for six years state medical director of the Modern Woodmen of America; superintendent and treasurer of the Twin City Ice and Cold Storage Company; died in the Burnham City Hospital, May 4, aged 80, of pneumonia.

Max William Alberts, St. Paul; University of Minnesota Medical School, Minneapolis, 1924; member of the American Medical Association; fellow of the American College of Surgeons; clinical assistant in surgery at his alma mater; recently elected first vice president of the Minnesota State Medical Association; served as president, vice president and secretary of the Minnesota State Board of Medical Examiners; served as vice president of the Minnesota Society for the Control of Cancer; attending surgeon, St. Joseph's, Charles T. Miller, Ancker and Children's hospitals and the Gillette State Hospital for Crippled Children; died June 11, aged 46, of coronary thrombosis.

Clare Fred Nesbitt Schram ✠ Kingsport, Tenn.; Columbia University College of Physicians and Surgeons, New York, 1916; served as president and secretary of the Sullivan-Johnson Counties Medical Society; past president of the American Association of Industrial Physicians and Surgeons; medical director of the Tennessee Eastman Corporation and Holston Ordnance Works; for many years head of the medical department of Fairbanks, Morse and Company in Beloit, Wis.; treasurer of the Women's Field Army for Cancer Control; on the staff of the Holston Valley Community Hospital; died May 22, aged 61, of coronary thrombosis.

Ralph Beverley Ober ✠ Springfield, Mass.; Harvard Medical School, Boston, 1901; specialist certified by the American Board of Surgery; member of the New England Surgical Society; fellow of the American College of Surgeons; served as a major in the medical corps of the U. S. Army during World War I; consulting surgeon and formerly president of the staff of the Springfield Hospital, where he served on the surgical staff for many years; for thirty-five years a member of the Massachusetts Mutual Life Insurance Company, serving as associate medical director; died in Sarasota, Fla., April 13, aged 66, of coronary thrombosis.

Roy Whittier Porteus ✠ Bellefontaine, Ohio; Rush Medical College, Chicago, 1906; interned at St. Anne's and St. Elizabeth's hospitals in Chicago; served a residency at the Roselia Maternity Hospital and Foundling Asylum in Pittsburgh; clinical assistant, department of otology, rhinology and laryngology at his alma mater, 1913-1914; at one time fellow in rhinology and otolaryngology at the Mayo Clinic in Rochester, Minn.; retired member of the Illinois State Medical Society and member of the Association of Resident and Ex-Resident Physicians of the Mayo Clinic; died March 27, aged 63, of uremia and heart disease.

Russell Hall Birge ✠ Cleveland; Harvard Medical School, Boston, 1898; assistant clinical professor of surgery at the Western Reserve University School of Medicine; fellow of the American College of Surgeons; served as chairman of the medical advisory board number 7 of the Selective Service and in the medical corps, U. S. Army, during World War I; past president of the Academy of Medicine of Cleveland and the Cleveland Medical Library Association; on the staff of the Lakeside Hospital, where he died May 16, aged 72, of dissecting and ruptured arteriosclerotic aneurysm of the abdominal aorta.

Edward Ackermann ✠ Dover, N. J.; University and Bellevue Hospital Medical College, New York, 1909; died in the General Hospital April 4, aged 69, of peritonitis, gangrene of the bowel and mesenteric thrombosis.

William E. Alexander, Memphis, Mo.; University of Louisville (Ky.) Medical Department, 1894; died in St. Joseph's Hospital, Keokuk, Iowa, April 18, aged 72, of ruptured appendix.

Aaron Hirst Appel ✠ Colonel, U. S. Army, retired, New York; Jefferson Medical College of Philadelphia, 1878; appointed an assistant surgeon in the U. S. Army in 1879; promoted to captain in 1884, major in 1897, lieutenant colonel in 1907 and colonel Jan. 28, 1910; retired June 6, 1911 at his own request after thirty years' service; returned to active duty from July 27, 1918 to July 10, 1919; died March 13, aged 88, of coronary thrombosis.

Bruce Elwyn Beeman ✠ Lancaster, N. Y.; University of Buffalo School of Medicine, 1934; interned at the Millard Fillmore Hospital in Buffalo, where he served a residency in medicine and obstetrics; died April 27, aged 34, of chronic pulmonary tuberculosis and myocardial failure.

Allen Christopher Bradley, Bridgeport, Conn.; New York Homeopathic Medical College and Hospital, New York, 1901; served as a member of the Selective Service Appeals Board; died April 11, aged 69, of carcinoma of the prostate and hypertensive heart disease.

Maurice Joseph Butler, Newport, R. I.; College of Physicians and Surgeons, Baltimore, 1906; served as medical examiner for Newport County; local medical representative of the Veterans Bureau and a United States insurance examiner; died May 4, aged 61, of valvular heart disease and chronic diffuse nephritis.

Hugh Lester Charles ✠ Atchison, Kan.; Chicago College of Medicine and Surgery, 1912; served in France during World War I; died April 13, aged 54, of coronary thrombosis.

Ugo A. D. Collelmo, Frontenac, Kan. (licensed in Kansas in 1907); honorary member of the Kansas Medical Society; member of the American Medical Association; died March 25, aged 78, of myocardial degeneration with cardiac thrombosis.

William Henry Conner, Batavia, N. Y.; Northwestern University Medical School, Chicago, 1907; served as passed assistant surgeon in the U. S. Public Health Service and on the staffs of various Veterans Administration facilities; major, medical reserve corps, U. S. Army, not on active duty; died April 28, aged 72, of coronary thrombosis.

Theodore W. Conzelman, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1883; died in St. Anthony's Hospital April 28, aged 82, of arteriosclerosis.

William Arnice Cotter, Ozark, Ala.; University of Louisville Medical Department, 1909; member of the American Medical Association; served as president of the Dale County Medical Society; died in the Moody Hospital, Dothan, April 3, aged 62, of heart disease.

Howard Hubbell Davis ✠ Cleveland; Western Reserve University Medical Department, Cleveland, 1910; received the Distinguished Service Cross for extraordinary heroism under fire overseas during World War I; on the staff of the Grace Hospital, where he died May 28, aged 62, of cerebral hemorrhage.

MAJOR LUTHER CALDWELL HEIDGER, M. C., A. U. S., 1897-1944

CAPT. ADRIAN Z. LEON, M. C., A. U. S., 1911-1945

Frances Dickinson ✠ Chicago; Woman's Medical College, Chicago, 1883; served as dean and president of the Harvey Medical College; honorary trustee of the Chicago Academy of Science; emeritus member of the Illinois State Medical Society; died in Orange City, Fla., May 19, aged 89, of coronary thrombosis and arteriosclerosis.

William West Duckering, Boston; Harvard Medical School, Boston, 1898; member of the American Medical Association; formerly on the staff of the Boston Dispensary; died May 3, aged 83.

Ethelbert L. Elmore, Puxico, Mo.; Barnes Medical College, St. Louis, 1905; member of the American Medical Association; died in the Missouri Baptist Hospital, St. Louis, April 24, aged 71, of carcinoma of the liver.

Leon Felderman ✠ Philadelphia; Medico-Chirurgical College of Philadelphia, 1911; formerly president of the North End Medical Society; a captain in the medical corps of the U. S. Army during World War I, serving overseas; during 1924-1925 surgeon general of the Veterans of Foreign Wars; in 1928 presented with the French Legion of Honor; served as chairman of the local draft board number 77 from its inception in 1940 until he recently resigned; on the staffs of many hospitals in Philadelphia; died May 14, aged 54, of coronary thrombosis.

Frederick Abraham P. Fetherolf ✠ Allentown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; fellow of the American College of Surgeons; served on the senior staff of the Allentown Hospital; died May 25, aged 64, of heart disease.

Warren Woden Foster ✠ Washington, D. C.; Harvard Medical School, Boston, 1882; member of the Connecticut State Medical Society and the American Medical Association; served as medical examiner for the U. S. Bureau of Pensions; died in the Emergency Hospital May 3, aged 86, of annular carcinoma of the ascending colon.

Joseph R. Gaines, Las Animas, Colo.; St. Louis College of Physicians and Surgeons, 1891; member of the American Medical Association; for many years county physician; died April 30, aged 79, of carcinoma of the prostate.

Boyd Emerson Gamble ✠ Manchester, Pa.; Medico-Chirurgical College of Philadelphia, 1909; died March 30, aged 61, of carcinoma of the esophagus.

Arthur Harold Gaston, Mount Lebanon, Pa.; Cleveland Homeopathic Medical College, 1908; died in the Veterans Administration Facility, Aspinwall, February 13, aged 62, of pulmonary edema and hypertensive heart disease.

Harvey Landis Gerberich, Lebanon, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1906; died March 14, aged 72, of chronic sclerotic myocarditis.

William Hammond, Glen Olden, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1894; died in the Taylor Hospital, Ridley Park, May 15, aged 74, of injuries received in a fall.

KILLED IN ACTION

Luther Caldwell Heidger, Stratford, Conn.; University of Vermont College of Medicine, Burlington, 1921; member of the American Medical Association; interned at the Bridgeport Hospital in Bridgeport; in 1929 appointed medical examiner of Stratford; commissioned a captain in the Army of the United States (National Guard) on Sept. 16, 1940; his first assignment was at Fort H. G. Wright, New York, as medical officer of the 242d Coast Artillery; in February 1941, at his request, transferred to Randolph Field, Texas, to take a flight surgeon's course; sent to Jacksonville, Fla., and later to Albuquerque, N. M., where he was assigned to the 19th Bombardment Group and promoted to major; previously reported missing in action and believed to be a prisoner of the Japs; awarded the Distinguished Service Cross, Air Medal and the Purple Heart; killed in action in Mindanao, P. I., Sept. 7, 1944, aged 47.

Carlton Patrick Hogan, Burlington, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1930; member of the American Medical Association; commissioned a captain in the medical corps, Army of the United States, on July 3, 1942; killed in action in the European area Nov. 27, 1943, aged 39. [It has been impossible to obtain a photograph of Dr. Hogan.]

Adrian Zacharia Leon, New York; Université de Montpellier Faculté de Médecine, France, 1936; member of the American Medical Association; entered the medical corps, Army of the United States, as a first lieutenant on April 13, 1944; began active duty May 6, 1944; assigned to Brooke General Hospital, Fort Sam Houston, San Antonio, Texas; promoted to captain; a battalion surgeon serving with the Seventh Army; won the Bronze Star for "tirelessly and diligently treating the wounded under the most trying conditions"; killed in action in Austria May 3, aged 33.

Zed Thomas Hawkins, South Pasadena, Calif.; Eclectic Medical Institute, Cincinnati, 1893; member of the American Medical Association; honorary member of the Indiana State Medical Association; died April 26, aged 77, of heart disease.

George Burton Heinecke ✠ Washington, D. C.; Columbian University Medical Department, Washington, 1892; at one time assistant demonstrator of anatomy at his alma mater, now known as the George Washington University School of Medicine; veteran of the Spanish-American War; for many years medical examiner for the Metropolitan Life Insurance Company and supervising medical inspector for the Royal Arcanum, a fraternal organization; died in the Emergency Hospital April 25, aged 73, of hypertensive heart disease.

Norris Cecil Hodge ✠ Marianna, Ark.; University of Tennessee College of Medicine, Memphis, 1926; interned at the Memphis General Hospital, Memphis, Tenn.; secretary of the Lee County Medical Society; served as medical officer in the Arkansas National Guard; president of the Farmers and Merchants Bank of Marianna; died April 21, aged 45, of coronary thrombosis.

Ford W. Huff, Parsons, W. Va.; Maryland Medical College, Baltimore, 1904; died June 6, aged 67, of diabetes mellitus.

William Richard Janeway, Staten Island, N. Y.; Columbia University College of Physicians and Surgeons, New York 1907; member of the American Medical Association; past president of the Richmond County Medical Society; director of the New York Tuberculosis and Health Association for two years and chairman of the Staten Island Tuberculosis and Health Committee; interned at St. Luke's Hospital in New York; on the staff of the Staten Island Hospital; died June 16, aged 62, of cerebral hemorrhage.

Clara Lydia Kohls ✠ San Francisco; University of California Medical School, San Francisco, 1927; died March 18, aged 48, of coronary occlusion.

MAJOR BENJAMIN RITTER, M. C., A. U. S., 1900-1945

LIEUT. MARSHALL J. ROGERS (MC), U.S.N.R., 1916-1945

Albert Arthur Krugg, Coffeyville, Kan.; Medico-Chirurgical College of Kansas City, Mo., 1898; member of the American Medical Association; served as a member of the city council and board of education; founder of the Coffeyville Hospital; author of "Facts and Fancies"; died February 17, aged 80, of diabetes mellitus.

Claud Armstrong Mathews, Austin, Texas; University of Texas School of Medicine, Galveston, 1911; member of the American Medical Association; examining physician for Selective Service Board number 3; on the staffs of St. David's Hospital, Seton Hospital and the Brackenridge Hospital, where he died April 10, aged 57, of subacute bacterial endocarditis.

Charles E. McClary, Syracuse, N. Y.; Rush Medical College, Chicago, 1886; member of the American Medical Association; on the staff of the Crouse-Irving Hospital; died March 6, aged 82, of coronary thrombosis and arteriosclerosis.

Henry Dudley Prescott, New Bedford, Mass.; Harvard Medical School, Boston, 1902; served on the staff of St. Luke's Hospital; fellow of the American College of Surgeons; died March 19, aged 68, of coronary occlusion.

Samuel I. Seidenberg, New York; University of Odessa Faculty of Medicine, Russia, 1910; member of the American Medical Association; resident in medicine at the Home and Hospital of the Daughters of Jacob, where he died February 4, aged 64, of cerebral thrombosis.

Sylvester Silburne Shannon ✠ Crosby, Minn.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1906; village health officer and school doctor; on the staff of the Miner's Hospital; died March 28, aged 62, of heart disease.

William Spencer Sharp ✠ Mesa, Ariz.; Medical Department of Tulane University of Louisiana, New Orleans, 1907; on the staffs of the Good Samaritan and St. Joseph's hospitals, Phoenix, and the Southside District Hospital; died April 30, aged 65, of heart disease.

Jonathan Mather Stafford, Essex, N. Y.; University of Vermont College of Medicine, Burlington, 1896; member of the American Medical Association; since 1908 health officer of Essex and county coroner since 1938; attending physician, Essex County Home since 1908; died March 23, aged 75, of coronary occlusion.

Bernard LeRoy Towle ✠ Pawtucket, R. I.; Medical School of Maine, Portland, 1897; died in the Memorial Hospital February 6, aged 68, of cerebral hemorrhage.

Arthur Francis Weston, Keene, N. H.; Boston University School of Medicine, 1903; on the staffs of the Malden (Mass.) and Westboro (Mass.) hospitals and the Elliot Community Hospital; died in the Boston City Hospital March 23, aged 72, of carcinoma of the esophagus and stomach.

Wright Charles Williams ✠ Peoria, Ill.; Miami Medical College, Cincinnati, 1903; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the Methodist Hospital; died May 12, aged 64, of leukemia.

Earle Montgomery Young ✠ Mitchell, S. D.; Rush Medical College, Chicago, 1912; died March 21, aged 57, of coronary occlusion.

Edmund Kostanty Zaworski, Cleveland; University of Wooster Medical Department, Cleveland, 1909; on the staff of St. Alexis Hospital, where he died April 9, aged 62.

KILLED IN ACTION

Benjamin Ritter ✠ New York; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1926; University and Bellevue Hospital Medical College, New York, 1931; interned at St. Joseph's Hospital and Dispensary in Pittsburgh and the Rockaway Reach Hospital and Dispensary in Rockaway Beach, N. Y.; associated with the Mount Sinai Hospital; entered the medical corps, Army of the United States, on Feb. 25, 1943, as a captain; began active duty in the same grade on March 12, 1943; attached to the Normandy Base Surgeon's Office; promoted to major; posthumously awarded the Purple Heart; had been overseas twenty-two months; killed in action in France March 9, aged 45.

Marshall Johnson Rogers, Rule, Texas; Baylor University College of Medicine, Dallas, 1942; entered the U. S. Navy as an assistant surgeon with the rank of lieutenant (jg) on June 25, 1942; served an internship at the Naval Hospital in Jacksonville, Fla.; began active duty in the U. S. Naval Reserve with the same rank on July 26, 1943; promoted to lieutenant in July 1944; served sea duty for eighteen months; killed February 21 by Jap aerial attack off Iwo Jima, aged 28.

Correspondence

ARTIFICIAL KIDNEY

To the Editor:—Referring to the editorial "Artificial Kidney" in the May 26 issue of THE JOURNAL, I would like to note that effective dialysis of the blood can also be achieved by using the living serous membranes instead of a semipermeable pipe system.

I revived nephrectomized dogs in uremic coma by perfusing their abdominal cavity with Ringer's, saline or isotonic dextrose solution (*Mitt. a. d. Grenzgeb. d. Med. u. Chir.* **39**:391, 1926).

During a perfusion lasting four hours, 3.968 Gm. of nonprotein nitrogen could be recovered from the perfusing fluid, whereby the protein nitrogen level in the blood of the animal dropped from 217 mg. per hundred cubic centimeters to 121.8. This procedure could be repeated and the life of the animal thus prolonged.

The feasibility of my technic of dialysis has been corroborated since then by a number of investigators (Heusser and Werder in 1927, Engel and Kerekes in 1927, Curtis in 1929 and 1930 and Jeney in 1932).

I also showed that intraperitoneal dialysis of the blood can easily be performed on human patients in local anesthesia without discomfort (*Wien. klin. Wchnschr.* **47**:851 [July 6] 1934).

Intact blood circulation and intact peritoneal cavity both are essential requirements for success.

STEPHAN ROSENAK, M.D.,
Gastro-Enterology Research Laboratory,
Mount Sinai Hospital,
New York.

DERMATOPHYTOSIS AND ONYCHOMYCOSIS

To the Editor:—The review by Montgomery and Casper of dermatophytosis and onychomycosis (THE JOURNAL, May 12, p. 77), as do so many papers on this subject, gives one the impression that these fungous infections can be cured without unusual difficulty. One notes in the discussion, however, Dr. Montgomery's confession that "the majority of extensive cases (of Trichophyton purpureum infection) are arrested and not cured." Unfortunately it is by these rebellious and long-standing cases that therapeutic skill is measured. For this reason it may be desirable to direct attention to two methods of treatment not mentioned in Dr. Montgomery's paper.

The first of these is freezing of the affected skin areas with ethyl chloride (*South. M. J.* **23**:1128 [Dec.] 1930). This method of treatment is regarded by some competent authorities as "probably the most effective single therapeutic agent."

The second method deals with chronic (toe) onychomycosis of the T. purpureum type, in which the entire thickness of the nail, and characteristically the entire nail, is involved. In the period 1933-1939 it was the policy of the U. S. Public Health Service in Havana, Cuba, to prohibit entry into the United States of refugees harboring chronic fungous infection of this nature. To expedite the entry of these unhappy individuals, no effort was spared to effect a "cure." After a year or more of interest as consultant to the service, it became evident to me that not a single actual cure had been brought about by the methods advocated by Dr. Montgomery—that is, removal of all affected nail areas and the continuous application of the strongest possible antimycotic remedies. Simple nail avulsion had also failed signally. It did not matter what later might be applied to the nail bed, or in what concentration. Regenerating epithelium invariably sealed off the budding nail plate, isolating it from all topical applications. When the nail plate finally emerged, it was always infected with the original fungus.

Accordingly, an operation was derived which aimed at the permanent ablation of the seriously infected toe nails (*Am. J. Surg.* **27**:145 [Jan.] 1935). It was learned that sharp curettage of the radix could not be depended on to prevent nail regeneration. Saucerization of overlying soft tissue and careful electrocauterization or fulguration of the radix were found to be necessary. Functionally these nailless toes were unhandicapped, and the cosmetic results were an improvement. Healing time for great toes averaged two months. These cures were absolute, not relative. Relapsing epidermophytoses and epidermophytids of many years' duration were finally susceptible to actual cure.

In a large series of operations performed under procaine digital nerve block, no serious complications were witnessed. Security of the digital circulation should, of course be manifest for this simple and effective operation.

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This communication has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this communication are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

THE CONTROL OF SCHISTOSOMIASIS

To the Editor:—Thirty years' close study of the control of schistosomiasis in Africa forces me to the conclusion that the natural enemies of snail hosts such as water beetles, river crabs, birds and lizards should be preserved, that chemicals interfering with wild life along the course of rivers should be avoided and that the present attacks on the iguana by natives and others should be controlled.

A steady infection among the natives in spite of improved education in places where chemicals have been used either to destroy the snail hosts or for mosquito control shows the mistake of such official efforts and adds interest to the effectiveness of removing river rushes and treating native carriers in other districts. Further use might well be made of burning cane or covering in portions of polluted streams occasionally, in view of the importance of small and easily overlooked snail hosts.

Increased efforts to control schistosomiasis and allied infections are needed in view of the spread of store keepers whose religion includes no clear teaching in regard to safeguarding the health of others and who allow human excreta and contaminated water to enter flowing streams, where they serve as constant means of infecting the primitive races, who are wont to collect and use water from running streams without water purification and who get their feet and hands contaminated by the free swimming larval parasites.

F. GORDON CAWSTON, F. Z. S., Durban, South Africa.

GAMMA GLOBULIN

To the Editor:—Comment in an editorial on gamma globulin in THE JOURNAL, June 9 (p. 442), gives the impression that only until recently has the origin of the globulins remained uncertain. Yet numerous investigators in the last fifty-three years have held views similar to those expressed in the papers referred to and to which no reference is made. Schmidt in 1892 first suggested that leukocytes, chiefly lymphocytes, are the source of fibrinogen. Moll in 1903 also suggested that some globulins arose from leukocytes. Müller in 1905 ascribed the source of fibrinogen to the lymphoid tissue of the spleen and lymph nodes. These and other references on the subject can be found in a study on "The Origin of Blood Proteins" (*Folia haemat.* **52**:187, 1934) in which substances having properties of fibrinogen, globulin and albumin were recovered from disintegrated lymphocytes.

HOBART A. REIMANN, M.D., Philadelphia.

POSTGRADUATE CONTINUATION COURSES FOR VETERAN AND CIVILIAN PHYSICIANS

Compiled by the Council on Medical Education and Hospitals for Period July 1, 1945 to Jan. 15, 1946

Medical schools, hospitals, state medical societies and other medical educational institutions and organizations are providing the Council with a growing body of information on courses designed primarily to meet the needs of returning medical officers. These have been incorporated into the lists on these pages. They are not specifically designated for veterans, since most if not all of them may also be open to interested civilian physicians. Furthermore, all courses listed which were not designed primarily for physician veterans are also open to qualified returning medical officers.

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Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ALLERGY (See also Dermatology and Syphilology)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Allergy	1 month, monthly	$200
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Massachusetts General Hospital	Clinical Allergy	July 9 thr. 20, 1945 2 weeks	50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Kings County Hospital	Allergy	Oct. 13, 1945 8 weekly sessions	20
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Roosevelt Hospital, New York	Allergy	Oct. 8 thr. 13, 1945 1 week	Members 20 Nonmembers 40
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Allergy in Relation to Internal Medicine	Oct. 22 thr. Dec. 14, 1945 8 weeks	60
	Allergy in Children	Oct. 26 thr. Dec. 14, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Allergy	Oct. 29, thr. Nov. 16, 1945 3 weeks, full time	200
	Allergy	Jan. 4 thr. Feb. 15, 1945 2 months, part time	25
	Symposium on Allergy	Jan. 7 thr. 11, 1946 5 days, full time	100
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Allergy	2 months, arranged	50
Vaughan Memorial Clinic, 201 West Franklin Street, Richmond, Va.	Fellowship in Allergy	6 months to 1 year, beginning Jan. 1 and July 1 each year	None
ANATOMY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Surgical Anatomy on Cadaver	Oct. 8 thr. 20, 1945 2 weeks	125
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Applied Anatomy of the Head and Neck	160 hours, arranged	300
	Applied Anatomy of the Upper Extremity	60 hours, arranged	115
	Applied Anatomy of the Lower Extremity	60 hours, arranged	115
	Applied Anatomy of the Abdomen	130 hours, arranged	either sex 300 both sexes 500
	Applied Anatomy for the Orthopedic Surgeon	100 hours, arranged	275
	Applied Anatomy for the Anesthetist	100 hours, arranged	275
	Applied Anatomy of the Thorax	120 hours, arranged	275
	Applied Anatomy of the Urogenital System	160 hours, arranged	295
University of North Carolina School of Medicine, Chapel Hill, N. C.	Anatomy	Full time, quarterly	per quarter 100
ANESTHESIOLOGY (See also Anatomy and Obstetrics and Gynecology)			
University of Georgia School of Medicine, University Place, Augusta, Ga. At: University Hospital	General Anesthesia (Inhalation and Intravenous)	2 weeks, arranged, throughout year	150
	Regional Anesthesia	2 weeks, arranged, throughout year	150
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Inhalation Anesthesia	1 month, every month	200
	Regional and Intravenous Anesthesia	2 weeks, every 2 weeks	150
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Boston City Hospital, Harvard Teaching Service, Faulkner Hospital	Clinical Anesthesia	Tentative—arranged, monthly	50

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ANESTHESIOLOGY—Continued			
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Anesthesiology	3, 6, or 12 days, announced	$15, $25, $50
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Anesthesia: Diagnostic and Therapeutic Nerve Blocking	Oct. 23 to Nov. 23, 1945 4 weeks	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Anesthesia	Sept. 1945 thr. Jan. 15, 1946 2 weeks, full time	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Regional, Spinal, Etc., Anesthesia	3 months, full time, 1st of any month	300
	Regional Anesthesia	12 sessions, arranged	75
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital and University	Anesthesia	6 months, Fall and Spring	Phys. in Serv. ½ fee Fee not stated
	Anesthesia	6 months to 1 year. Fall and Spring	
ARTHRITIS			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Arthritis	Oct. 17, 1945 8 weekly sessions	20
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Arthritis and Allied Rheumatic Disorders	Oct. 22 thr. 26, 1945 5 days, full time	45
	Arthritis and Allied Rheumatic Disorders	Jan. 8 thr. Feb. 26, 1946 2 months, part time	45
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Arthritis and Rheumatic Disorders	6 weeks, 3 mornings a week every 6 weeks	100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Abington Memorial Hospital	Etiology, Pathology, Physiological Deviations and Treatment of Arthritis	Oct. thr. Dec. 1945 Thursday mornings	25
BACTERIOLOGY			
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Clinical Bacteriology and Serology	Jan. 2 thr. 31, 1946 1 month, part time	100
University of North Carolina School of Medicine, Chapel Hill, N. C.	Bacteriology	Full time, quarterly	per quarter 100
CARDIOVASCULAR DISEASES (See also Electrocardiography)			
California Heart Association, 277 Pine Street, San Francisco At: Los Angeles and San Francisco	Postgraduate Symposium in Cardiovascular Disease	Oct. 18 thr. 25, 1945 3 days in San Francisco 2 days in Los Angeles	10 to 15
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Massachusetts General Hospital, Boston	Recent Advances in the Diagnosis and Treatment of Cardiovascular Disease	Nov. 5 thr. 10, 1945 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Peter Bent Brigham Hospital, Boston	Modern Diagnosis and Treatment of Heart Disease	July 2 thr. 31, 1945 4 weeks, daily	150
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Israel Zion Hospital	Clinical Cardiology	Oct. 16, 1945 4 sessions—once a week	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Elementary Clinical Cardiology	Oct. 2 thr. Dec. 18, 1945 Tuesdays, 1 to 4 p. m.	50
	Advanced Clinical Cardiology	Jan. 8, thr. June 6, 1946 Tuesdays, 1 to 4 p. m.	100
	Supplementary Clinical Cardiology	Oct. 2 thr. Dec. 18, 1945 and Jan. 8 thr. March 19, 1946 Tuesdays, 1 to 4 p. m.	50
At: Mount Sinai Hospital	Intensive Course in X-ray of the Heart and Great Vessels	Oct. 26, 1945 thr. Jan. 11, 1946 12 weeks, part time	30
	Bedside Clinics in Heart Disease	Oct. 22 thr. Dec. 10, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Cardiology	Dec. 3 thr. 7, 1945 5 days, full time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Cardiology	20 hours, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Diagnosis and Treatment of Diseases of the Heart	3 weeks, 2 hours daily Arranged	75
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Philadelphia General Hospital	Advanced Cardiology	Nov. 26 thr. Dec. 1, 1945 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
Woman's Medical College of Pennsylvania, Henry and Abbotsford Road, Philadelphia 29	Clinical Cardiology	2 weeks, arranged	100
Washington State Medical Association, 218 Cobb Building, Seattle, Washington At: King County Hospital, Seattle	Refresher Course in Cardiology	Arranged	Arranged
CHEST DISEASES (See also Anatomy, Medicine and Radiology)			
California Tuberculosis Association, 45 Second Street, San Francisco At: various clinics and sanatoriums throughout the state	Post-Graduate Education	3 days to 3 weeks	None
Municipal Tuberculosis Sanitarium, 5601 North Pulaski, Chicago	Post-Graduate Course in Tuberculosis	Arranged, continuous	None
Mississippi State Sanatorium, Sanatorium, Miss.	Chest Diseases and Internal Medicine	2 to 6 weeks, entire year	None
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Diseases of the Chest (Advanced)	Oct. 26, 1945 thr. Feb. 8, 1946 16 weeks	50
At: Presbyterian Medical Center	Recent Advances in the Treatment of Bronchial Asthma, Bronchiectasis and Pulmonary Emphysema	Oct. 22 thr. Nov. 2, 1945 2 weeks, full time	40
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Acute and Chronic Diseases of the Chest	Jan. 3 thr. Feb. 28, 1946 2 months, part time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Metropolitan Hospital Division	Clinical Pulmonary Diseases	1 month, arranged	100
	Diseases of the Respiratory System	1 month, arranged	150
Edward L. Trudeau Foundation and Columbia University At: Saranac Lake, New York and Bellevue Hospital, New York	Trudeau School of Tuberculosis	Sept. 10, 1945, 4 weeks (plus 2 weeks optional course following at Bellevue Hosp., N. Y. C.	100
Woman's Medical College of Pennsylvania, Henry and Abbotsford Road, Philadelphia 29	The Tuberculosis Problem	Oct. 1945, weekly lectures Arranged	per lecture 3

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
DERMATOLOGY AND SYPHILOLOGY (See also Medicine and Physical Medicine)			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Massachusetts General Hospital	Dermatology	1 month, arranged	40
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Clinical Dermatology and Syphilology	6 weeks or 3 months part time arranged	50 or 85
	Diagnosis and Management of Syphilis	Oct. 5, 1945 thr. Apr. 26, 1946 7 months, part time	100
	Diagnosis and Treatment of Syphilis	6 weeks or 3 months part time, arranged	30 or 50
	Practical Instruction in Diagnosis and Management of Syphilis	6 weeks or 3 months part time arranged	50 or 85
	Practical Instruction in Dermatological Allergy and Immunology	6 weeks or 3 months part time, arranged	50 or 85
	X-ray Treatment of Ringworm of the Scalp	Oct. 1, 1945 3 months, part time	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Dermatology and Syphilology	3 months, part time 1st of any month	75 Phys. in Serv. ½ fee
	Dermatology and Syphilology	6 weeks, part time 1st of any month	50 Phys. in Serv. ½ fee
University of Wisconsin Medical School, 418 North Randall Street, Madison, Wis.	Dermatology for Specialists	2 to 6 months, arranged	per month 100
DIABETES			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: New England Deaconess Hospital	Diabetes Mellitus in Relation to General Medicine	July 9, 10, 11, and Oct. 1, 2, 3, 1945	20
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Diabetes	Oct. 16, 1945 8 weeks on Tuesdays	20
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diabetes Mellitus, Nephritis and Hypertension	Nov. 26 thr. 30, 1945 5 days, full time	45
	Diabetes Mellitus, Nephritis and Hypertension	Jan. 3 thr. Feb. 28, 1946 2 months, part time	45
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Philadelphia Hospital	Diabetes Mellitus	2 to 4 weeks, 75 hours Arranged	150
ELECTROCARDIOGRAPHY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Electrocardiography and Heart Disease	Aug. 6, 1945, 2 weeks	150
	Electrocardiography and Heart Disease	Sept., Oct. and Nov. 1945 1 month	175
Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago 16	Electrocardiography	Aug. 20 thr. Sept. 1, 1945 2 weeks, full time	110
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Electrocardiographic Diagnosis	Nov. 5 thr. 10, 1945 6 days	50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Electrocardiography	Oct. 15, 1945, 5 weeks, 15 sessions	20
	Electrocardiography and Clinical Cardiology	Oct. 16, 1945, 5 weeks, 15 sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Elementary Electrocardiography	Oct. 4 thr. Dec. 20, 1945 Once a week	35
	Advanced Electrocardiography	Jan. 3 thr. March 14, 1946 Thursdays, 2-4 p. m.	35
	Supplementary Electrocardiography	Oct. 4 thr. Dec. 20, 1945 and Jan. 3 thr. Mar. 14, 1946 Thursdays, 4-5:30 p. m.	35
At: Mount Sinai Hospital	Intensive Course in Clinical Electrocardiography	Oct. 26, 1945 thr. Jan. 11, 1946 12 weeks	35
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Electrocardiography	Oct. 29 thr. Nov. 2, 1945 5 days, full time	50
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Electrocardiography	15 hours, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Electrocardiographic Interpretation	2 weeks, 2 hours daily, arranged	75
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Philadelphia Hospital	Electrocardiology and Cardiac Roentgenology	5 days, 30 hours Arranged	60
ELECTROENCEPHALOGRAPHY			
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Electroencephalography	2 weeks, arranged	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Clinical Electroencephalography	Jan. 14 thr. 19, 1946 6 days, full time	60
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Graduate Hospital and Pennsylvania Institute	Electroencephalography	36 hours, arranged 6 Thursdays	150
ENDOCRINOLOGY (See also Medicine and Obstetrics and Gynecology)			
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: Northwestern University, Chicago	Endocrinology	Fall 1945, 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Female Sex Endocrinology	Oct. 16, 1945 10 weekly sessions	20
At: Long Island College Hospital	Endocrine Diseases and Disorders in Children and Adolescents	Oct. 15, 1945 8 weekly sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Endocrinology and Metabolism	Dec. 17 thr. 22, 1945	35
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Endocrinology	2 weeks, arranged	100
ENDOSCOPY			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Practical Cystoscopy	2 weeks, every 2 weeks	150
	Urology and Cystoscopy	4 weeks, every 4 weeks	375
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Cystoscopy and Endoscopy	Oct. 1, 1945 thr. June 1946 15 weeks, part time	75
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Presbyterian Medical Center	Bronchoscopy	Oct. 1945 thr. Apr. 1946 3 weeks, arranged	250

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ENDOSCOPY—Continued			
Temple University Medical School, Broad Street at Ontario, Philadelphia	Broncho-esophagology	Sept. 10 thr. 22, 1945 2 weeks	250 Phys. in Serv. 50
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Surgical and Anatomical Laboratories; the Graduate, University, Philadelphia and Mount Sinai Hospitals	Bronchoesophagology, Gastroscopy and Laryngeal Surgery	2 weeks, 85 hours Arranged	250
At: Graduate and Presbyterian Hospitals	Cystoscopy, Chromoureteroscopy and Pyelography	6 weeks, 36 hours Arranged	300
FRACTURES			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Kings County Hospital	Fractures	Oct. 19, 1945 10 weekly sessions	20
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Fractures and Allied Trauma	Arranged	150
GASTROENTEROLOGY (See also Proctology, Radiology and Surgery)			
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Chicago	Gastroenterology	Fall, arranged	Members 20 Nonmembers 40 Phys. in Serv. Free
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Beth El Hospital	Gastroenterology	Nov. 1, 1945 7 weeks, Thursdays	20
At: Jewish Hospital	Gastroenterology	Oct. 9, 1945, 8 sessions, twice weekly	20
At: Greenpoint Hospital	Gastroenterology	Oct. 16, 1945 12 sessions, twice weekly	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Gastroscopy (Medical)	Oct. 22 thr. Nov. 3, 1945 2 weeks	30
	Gastrointestinal Disorders	Oct. 22 thr. Dec. 14, 1945 8 weeks	75
	Physiology of Digestive Tract	Oct. 24 thr. Dec. 28, 1945 10 weeks	30
At: Presbyterian Medical Center	Gastroscopy	Oct. 1945 thr. June 1946 Arranged	200
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Gastroenterology	Oct. 15 thr. 19, 1945 5 days, full time	45
	Gastroenterology	Jan. 2 thr. Feb. 27, 1946 2 months, part time	45
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Gastroenterology	1 month, arranged	100
	Gastroscopy	1 month, arranged	100
	Peritoneoscopy	Arranged	75
At: Metropolitan Hospital	Gastrointestinal Surgery	14 sessions, arranged	200
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Gastroenterology	Oct. 1, 1945, and Jan. 2, 1946 6 weeks, part time	50
	Proctology and Gastroenterology (also Cadaver Proctology)	Oct. 1, 1945, and Jan. 2, 1946 6 weeks, part time	200 Phys. in Serv. ½ fee
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Clinical Gastroenterology	Fall and Spring 5 months, once weekly	100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Graduate Hospital	Clinical Gastroenterology	16 weeks, 500 hours Arranged	400
HEMATOLOGY (See also Pathology)			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Clinical Hematology	Oct. 18, 1945 8 weekly sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Elementary Clinical Hematology	Oct. 4 thr. Dec. 20, 1945 Thursdays 2-5 p. m.	35
At: Mount Sinai Hospital	Clinical Hematology (Elementary)	Oct. 22 thr. Dec. 13, 1945 8 weeks	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Hematology	1 month, arranged	100
INDUSTRIAL MEDICINE			
University of Michigan School of Public Health, An Arbor, Mich.	Industrial Health	3 days to 2 weeks, arranged	10
	Rehabilitation and Replacement of Industrial Personnel	3 days, announced	
LEGAL MEDICINE			
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15	Seminar in Legal Medicine	Oct. 1 thr. 6, 1945. 6 days	25
MEDICINE, GENERAL (See also Chest Diseases, Electrocardiography, Gastroenterology, Obstetrics and Gynecology, Neurology and Psychiatry, and Surgery)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Diseases of Colon and Rectum	Aug. 6 and Oct. 1, 1945 1 week	75
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Refresher Course for Ex-Military Personnel	July 1, 1945, 3 months every 3 months	Res. 75 Non-Res. 100
State University of Iowa School of Medicine, University Campus, Iowa City	General Medicine	3 months, arranged	100
University of Kansas School of Medicine, 39th Street and Rainbow Boulevard, Kansas City 3, Kansas At: University of Kansas Hospitals	Refresher Course	Sept. 15, 1945, 8 weeks	
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Internal Medicine	Oct. 15 thr. 20, 1945	25
Maine Medical Association, 142 High Street, Portland, Maine At: Boston	Refresher Course	1 to 2 weeks, arranged	
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Michigan Medical School, Ann Arbor	Internal Medicine	Oct. 22 thr. Nov. 3, 1945 2 weeks	Members 20 Nonmembers 40 Phys. in Serv. Free
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich. At: Various centers throughout the state	Extramural Postgraduate Course	Fall, 1 day weekly, 4 times	None
At: University of Michigan Hospital	Personal Courses	Varying lengths, throughout the year	per month 25

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
MEDICINE, GENERAL—Continued			
Wayne University College of Medicine, 1516 St. Antoine Street, Detroit	Medical-Pathological Conference	July thr. Sept. 1945 1 hour weekly	
	Therapeutic Conference	July thr. Sept. 1945 ½ hour weekly	
	Hematology Clinic	July thr. Sept. 1945 ½ hour weekly	
	Gastroenterology	July thr. Sept. 1945 1 hour weekly	
At: Receiving Hospital	Seminar	July thr. Sept. 1945 1 hour weekly	
	Diagnostic Conference	July thr. Sept. 1945 2 hours weekly	
At: Eloise Hospital	Seminar	July thr. Sept. 1945 1 hour weekly	
	Diagnostic Conference	July thr. Sept. 1945 1 hour weekly	
University of Minnesota Center for Continuation Study, Minneapolis 14	Medicine	3, 6, or 12 days, announced	15, 25, or 50
	Postwar Program in Medicine	Tentative, quarterly	
Mississippi State Sanatorium, Sanatorium, Miss.	Chest Diseases and Internal Medicine	2 to 6 weeks, throughout year	None
Omaha Mid-West Clinical Society, 1036 Medical Arts Building, Omaha At: Hotel Paxton, Omaha	13th Annual Assembly	Oct. 22 thr. 26, 1945	5 Phys. in Serv. and Faculty and Students of Neb. Med. Schools Free
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Hypertension and Nephritis	Oct. 17,1945 8 weekly sessions	20
At: Israel Zion Hospital	Pathology of Internal Medicine	Oct. 10, 1945 12 weekly sessions	50
	Peripheral Vascular Diseases	Oct. 9, 1945 8 weekly sessions	20
University of Buffalo School of Medicine, Department of Postgraduate and Continuation Work, 24 High Street, Buffalo	For General Practitioners	Sept. 24 thr. 29, 1945 1 week	30
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Chemical Data	Oct. 24 thr. Dec. 12, 1945 8 weeks	25
	Geriatrics: Disease in the Aged	Oct. 25 thr. Dec. 20, 1945 8 weeks	25
	Kidneys: Arteries	Nov. 22, 1945 thr. Jan. 17, 1946 8 weeks	15
	Liver and Biliary Passage	Oct. 24, 1945 thr. Jan. 2, 1946 11 weeks	40
	Peripheral Vascular Diseases	Oct. 23, 1945 thr. Jan. 8, 1946 15 weeks	35
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diseases of the Liver and Biliary Tract	Jan. 2, thr. Feb. 27, 1946 2 months, part time	30
	Diseases of the Thyroid and Other Endocrine Glands, and Nutrition	Jan. 4 thr. Feb. 15, 1946 2 months, part time	45
	Peripheral Vascular Diseases	Dec. 10 thr. 14, 1945 5 days, full time	45
	Peripheral Vascular Diseases	Jan. 8 thr. Feb. 26, 1946 2 months, part time	30
	Problems in Diagnosis	Jan. 7 thr. Feb. 25, 1946 2 months, part time	45
	Psychological Aspects of Internal Medicine	Jan. 4 thr. Feb. 15, 1946 2 months, part time	25
	Seminar in Internal Medicine	Jan. 2 thr. Feb. 28, 1946 1 or 2 months, full time	1 month 125 2 months 200
New York Academy of Medicine, 2 East 103rd Street, New York 29 At: Academy and selected local hospitals	Contributions of the War Effort to Medicine	Oct. 8 thr. 19, 1945 2 weeks	5
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Physical Diagnosis	1 month, arranged	150
	Peripheral Vascular Disease	2 weeks, arranged	150
At: Metropolitan Hospital Division	Internal Medicine	1 month, arranged	150
	Diseases of the Liver and Biliary System	1 month, arranged	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Course for General Practitioners	3 months, arranged	150
	Course for General Practitioners	6 weeks, arranged	100 Phys. in Serv. ½ fee
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Internal Medicine	1 month, 9-12 daily Offered monthly	50
Duke University School of Medicine, Durham, N. C. At: Duke Hospital	General Medicine	1 or 2 weeks or longer Arranged at any time	None
University of North Carolina School of Medicine, Chapel Hill, N. C. At: University and various towns	Postgraduate Medical Course	6 to 8 weeks, arranged Fall, Winter, Spring	25
Ohio State University College of Medicine, 11th and Neil Avenues, Columbus 10, Ohio	Postgraduate Continuation Studies	2 weeks to 3 months Beginning July 1, 1945	per week 25
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Oregon, Portland	General Medicine	Fall 1945, 1 week	Members 20 Nonmembers 40 Phys. in Serv. Free
University of Oregon Medical School, Marquam Hill, Portland	General Refresher Course	Arranged	per month 75
Medical College of the State of South Carolina, Alumni Association, 16 Lucas Street, Charleston	Alumni Association Refresher Course	Oct. 30 thr. Nov. 1, 1945 3 days	5
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Texas School of Medicine, Galveston	Internal Medicine	Nov 5 thr. 10, 1945. 1 week	None
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Medicine and Pediatrics	2 months, arranged	75
Washington State Medical Association, Committee on Postgraduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital, Seattle	Refresher Course in Medicine	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course for Specialists in Internal Medicine	2 to 6 months, arranged	per month 100
	12 Week Postgraduate Course (Various Subjects)	Arranged	125
At: Wisconsin General Hospital	Observation Course in Medical and Clinical Subjects	1 to 5 months, arranged	per month 100
	Observation Course in Medical and Surgical Subjects	1 to 5 months, arranged	per month 100

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
NEUROLOGY AND PSYCHIATRY (See also Medicine and Ophthalmology)			
Catholic University of America, Washington, D. C.	Case Seminar in Psychotherapy	Oct. 1945 thr. June 1946 2 hrs. a week	per semester 150 per semester hr. 10
	Child Psychiatry	Oct. 1, 1945, 4 months Twice a week	As above
	Individual Clinical Conferences	Oct. 1945 thr. June 1946 2 hrs. a week	As above
	Individual Conferences and Consultations on Literature and Technique	Oct. 1945 thr. June 1946 2 hrs. a week	As above
	Psychopathology	Oct. 1945 thr. June 1946 1 hr. a week	
	Seminar in Clinical Psychology and Psychotherapy	Oct. 1, 1945 2 hrs. a week	As above
At: University and St. Elizabeths Hospital	Introduction to Psychiatry	Oct. 1945 thr. June 1946 2 hrs. a week	As above
At: St. Elizabeths Hospital	Clinical Psychiatry	Oct. 1946 thr. June 1946 2 hrs. a week	As above
	Electric Shock Therapy	Oct. 1, 1945, 4 months 1 hr. a week	As above
	Neurology and Neuropathology	Oct. 1945 thr. June 1946 3 hrs. a week	As above
St. Elizabeths Hospital, Washington 20, D. C.	Psychiatry and Psychosomatic Medicine	Arranged	
Institute for Psychoanalysis, 43 East Ohio Street, Chicago 10	Basic Principles of Psychodynamics	Oct. 5 thr. Dec. 22, 1945 Alternate Fridays	15
	Development of the Personality	Winter quarter	
	Psychosomatic Medical Demonstrations and Discussions Using Clinical Material	Tentative	
The Menninger Clinic, Topeka, Kansas	Clinical Conferences (Case Seminar)	July 1, 1945 thr. Jan. 15, 1946 (except Aug. 1945)	Arranged
Boston Psychoanalytic Institute	Civilian War Neuroses and Their Treatment	Sept. 1945 thr. Jan. 1946 and Jan. thr. June 1946	None
American Institute for Psychoanalysis (Auspices of Association for Advancement of Psychoanalysis), 135 East 63d Street, New York	Clinical Conferences	Sept. 27, 1945, 10 weeks	12.50
	Psychiatry and Psychoanalysis	Sept. 28, 1945, 10 weeks	12.50
	Readings in Freud	Oct. 1, 1945, 40 weeks	25
	Theory of Neurosis	Oct. 2, 1945, 10 weeks	12.50
At: New School for Social Research	Introduction to the Rorschach Method of Personality Diagnosis	Oct. 3, 1945, 15 weeks	17.50
	The Psychology of Military and Civilian Casualties	Sept. 28, 1945, 15 weeks	15
	Seminar on Meanings of Dreams	Sept. 27, 1945, 15 weeks	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York	Clinical Neurology (Advanced)	Oct. 22, 1945, thr. Jan. 11, 1946 12 weeks	35
At: Mount Sinai Hospital	Neuroanatomy	Oct. 22, 1945, 46 hrs.	75
	Neuropathology	Oct. 22, 1945, 30 hrs.	60
	Neuroanatomy and Neuropathology	Oct. 22, 1945, 76 hrs.	100
At: Neurological and Psychiatric Institutes	Trimester in Neurology and Psychiatry	Oct. 1 thr. Dec. 7, 1945 2 months, full time or part time	Full time 250
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Neurology and Psychiatry for Pediatricians	Oct. 15 thr. 27, 1945 2 weeks, full time	75
	Neurological and Psychiatric Diagnosis and Treatment in General Practice	Nov. 26 thr. Dec. 7, 1945 2 weeks, full time	75
	Psychoanalysis in General Medicine	Jan. 2 thr. March 27, 1946 Part time	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Introduction to Psychoanalysis	10 lectures, arranged	20
	Psychoanalysis and Psychiatry	15 sessions, arranged	30
	Readings in Psychoanalytic Literature	15 sessions, arranged	30
	Seminar in Psychosomatic Medicine	12 sessions, arranged	25
At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Neurology	1 month, full time, arranged	200
New York University College of Medicine, 477 First Avenue, New York	Neurology	3 months to 1 year Daily 9 a. m. to 5 p. m.	200 to 600
At: Bellevue Hospital	Neuropsychiatry	3 months to 1 year Daily 9 a. m. to 5 p. m.	200 to 600
	Psychiatry	3 months to 1 year Daily 9 a. m. to 5 p. m.	200 to 600
Philadelphia Psychoanalytic Institute, 206 South 13th Street, Philadelphia 7	The Delinquent Child	Oct. 2, 1945 thr. Apr. 2 1946 Once weekly	Arranged
	Colloquim on Problems in Psychosomatic Medicine	Arranged	Arranged
At: Bellevue Stratford Hotel	Orientation Course in Normal Behavior	Sept. 18, 1945 thr. March 26, 1946 Once weekly	Arranged
	Pediatric Psychiatry	Arranged	Arranged
	Psychopathology of Childhood	Sept. 25, 1945 thr. Apr. 30, 1946 12 sessions	12
	Seminar on Psychoanalytic Psychiatry	Arranged	Arranged
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Medical Laboratories; Graduate, University, Philadelphia and Pennsylvania Hospitals; and Penn Institute	Clinicobiologic Neurology and Psychiatry (A Special Faculty Course Designed for Staff Members of Mental Institutions)	10 weeks, 250 hours Arranged	100
At: Philadelphia Hospital	Clinical Psychiatry	8 weeks, 240 hours Arranged	160
Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Philadelphia 29	Psychoneuroses	Oct. 1945, weekly lectures Arranged	per lecture 3
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course in Neuropsychiatry for Specialists	2 to 6 months Arranged	per month 100
NEUROSURGERY			
University of Wisconsin Medical School, 418 North Randall Street, Madison	Neurosurgery for Specialists	2 to 6 months, arranged	per month 100
NUTRITION (See also Medicine)			
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Nutrition in Health and Disease	Oct. 8 thr. 12, 1945 5 days, full time	45

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OBSTETRICS AND GYNECOLOGY (See also Medicine, Pathology and Surgery)			
Chicago Maternity Center, 1336 Newberry Avenue, Chicago	Home Obstetrics	3 months, every 3 months	None
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Obstetrics	Oct. 8, 1945, 2 weeks	150
	Operative Gynecology	Aug. 6, 1945, 2 weeks	150
	Operative and Office Gynecology	Oct. 22, 1945, 2 weeks	150
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Combined Obstetric and Pediatric Refresher	Aug. 21 thr. 26, 1945 1 week	10
	Obstetrics and Gynecology	2 weeks, beginning any Monday throughout year	10 Ill. Phys. Free
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Obstetrics and Gynecology	Jan. 14 thr. 18, 1946 5 days	25
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Boston Lying-In Hospital	Clinical Obstetrics	Aug. thr. Dec. 1945 1 month or longer	125
At: Free Hospital for Women	Gynecology	July, Aug., Sept., 1945 Arranged	per month 75
University of Minnesota Center for Continuation Study, Minneapolis 14	Obstetrics and Gynecology	Tentative, 3, 6, 12 days Announced	15, 25, 50
Department of Health of State of Nebraska, Division of Maternal and Child Health, Lincoln 9 At: University of Nebraska College of Medicine At: Various cities in Nebraska	Intramural Obstetric and Pediatric Training—Postgraduate	Announced	None
	Extramural Obstetric and Pediatric Training—Postgraduate	Aug. 27 thr. Sept. 7, 1945 and Nov. 19 thr. 23, 1945	None
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2	Prenatal Care	Oct. 18, 1945 8 weekly sessions	20
	Manikin	Oct. 16, 1945 12 weekly sessions	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Margaret Hague Maternity Hospital	Observation Course in Obstetrics	1 month, 1st of any month	100
	Practical Course in Obstetrics	3 months, full time 1st of any month	350 Maintenance supplied
At: Mount Sinai Hospital	Recent Advances in Gynecology	Nov. 12 thr. 17, 1945 6 days	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diagnosis and Office Treatment	Oct. 1 thr. Dec. 22, 1945 and Jan. 2 thr. Feb. 2, 1946 Arranged, part time	40-60
	Gynecological Endocrinology	Oct. 2 thr. Nov. 27, 1945 and Jan. 3 thr. Feb. 26, 1946 2 months, part time	100
	Seminar in Gynecology	Oct. 1 thr. Nov. 30, 1945 2 months, full time	225
	Seminar in Gynecology	Jan. 2 thr. March 30, 1946 3 months, full time	300
	Surgical Anatomy as Applied to Operative Gynecology (Cadaver)	Oct. 1945 thr. Jan. 1946 12 sessions, part time	200
	Symposium on Recent Advances in Gynecology	Sept. 24 thr. 29, 1945 6 days, full time	50
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Clinical and Operative Gynecology (Cadaver)	6 weeks, arranged	175
	Obstetrics and Gynecology	Oct. 1, 1945 2 months, full time	250 Phys. in Serv. ½ fee
Philadelphia Lying-In Hospital, 8th and Spruce Streets, Philadelphia	Graduate Medical Course in Caudal Analgesia	July 1 thr. Sept. 15, 1945 1 week, starting Mondays	50
Woman's Medical College of Pennsylvania, Henry Avenue and Abbotsford Road, Philadelphia 29	Practical Obstetrics	Arranged	Arranged
	Practical Gynecology	3 weeks, arranged	75
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Surgery; Obstetrics and Gynecology	2 months, arranged	75
Washington State Medical Association, Committee on Postgraduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital	Refresher Course in Obstetrics and Gynecology	Arranged 2 to 6 months, arranged	Arranged per month 100
University of Wisconsin Medical School, 418 North Randall Street, Madison	Obstetrics and Gynecology for Specialists		
OPHTHALMOLOGY (See also Medicine and Otorhinolaryngology)			
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago	Postgraduate Conference in Neuromuscular Anomalies of the Eyes	Oct. 28 thr. Nov. 2, 1945	55
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Ophthalmology	2 weeks, every 2 weeks	50
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Clinical Course in Ophthalmology	Oct. 1945, 12 months	per quarter 75
American Academy of Ophthalmology and Otolaryngology, 239-100 First Avenue Building, Rochester, Minnesota	Home Study Course in Ophthalmology	Sept. 1, 1945 thr. May 1946	10
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Ophthalmoscopy (Elementary)	Jan. 15 thr. March 15, 1946 2 months, part time	35
	Embryology of the Eye	Oct. 24 thr. Dec. 12, 1945 8 weeks	40
At: Mount Sinai Hospital	External Diseases of the Eye	Oct. 25, 1945 thr. Jan. 17, 1946 12 weeks	25
	Extra-Ocular Muscles	Oct. 25 thr. Dec. 20, 1945 8 weeks	20
	Histopathy of the Eye	Oct. 22, 1945 thr. Jan. 7, 1946 12 weeks	50
	Ophthalmic Surgery	Oct. 24, 1945 thr. Jan. 9, 1946 12 weeks	100
	Ophthalmoscopy (Elementary)	Oct. 22, 1945 thr. Jan. 7, 1946 12 weeks	20
	Ophthalmological Neurology	Oct. 26 thr. Dec. 14, 1945 8 weeks	25
	Physiological Optics	Oct. 23, 1945 thr. Jan. 8, 1946 10 weeks	40
	Refraction	Oct. 25, 1945 thr. Jan. 17, 1946 12 weeks	45
	Slit Lamp Microscopy	Oct. 24 thr. Dec. 14, 1945 8 weeks	30

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OPHTHALMOLOGY—Continued			
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Anatomy and Physiology	1 month, arranged	40
	Anatomy of the Temporal Bone	1 month, arranged	45
	Bacteriology, Serology and Immunology	1 month, arranged	40
	Embryology	1 month, arranged	40
	External Eye Diseases—Ocular Therapy	1 month, part time, arranged	40
	Glaucoma Clinic	10 hours, arranged	40
	Histo-pathology of the Eye	3 months, part time, arranged	85
	Motor Anomalies	1 month, arranged	40
	Neuro-Ophthalmology	1 month, arranged	30
	Perimetry	1 month, part time, arranged	40
	Ocular Muscles	1 month, part time, arranged	40
	Operative Eye Surgery	1 month, part time, arranged	75
	Ophthalmoscopy	1 month, part time, arranged	40
	Orthoptics	1 month, arranged	40
	Physiologic Optics	2 months, part time, arranged	75
	Plastic Eye Surgery	6 days, part time, arranged	75
	Refraction	3 months, part time, arranged	100
	Slit Lamp Microscopy	1 month, part time, arranged	50
	X-ray	6 hours, arranged	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Anomalies of Ocular Muscles	Oct. 22 thr. 26, 1945, 6 days, full time	60
	Differential Diagnosis with the Slit Lamp	Nov. 5 thr. 9, 1945 5 days, part time	45
	Embryology, Histology and Pathology of the Eye	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 15 sessions, arranged	75
	Motor Anomalies of the Eye	Oct. 15 thr. 20, 1945 6 days, full time	75
	Ophthalmic Neurology	Nov. 5 thr. 9, 1945 5 days, part time	45
	Surgery of the Eye	Oct. 29 thr. Nov. 3, 1945 6 days, full time	75
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Ophthalmology	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	50
	Ophthalmology	Oct. 1, 1945 and Jan. 2, 1946 3 months, part time	275
	Otolaryngology and Ophthalmology (also Cadaver)	Oct. 1, 1945 and Jan. 2, 1946 3 months, full time	600
	Refraction	6 weeks, part time arranged	100 Phys. in Serv. ½ fee
University of Rochester School of Medicine, 260 Crittenden Boulevard, Rochester 7, N. Y.	Thirteenth Summer Graduate Course in Ophthalmology	July 30 thr. Aug. 1945	40
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Wills Eye Hospital	Ophthalmic Histology and Pathology	8 weeks, 96 hours Arranged	200
Virginia Society of Ophthalmology and Otolaryngology, Box 1685, University Station, Charlottesville At: Medical College of Virginia, Richmond	Postgraduate Course in Ophthalmology	Dec. 1945, 2 days	30
University of Wisconsin Medical School, 418 North Randall Street, Madison	Ophthalmology for Specialists	2 to 6 months, arranged	per month 100
ORTHOPEDIC SURGERY (See also Anatomy)			
State University of Iowa School of Medicine, University Campus, Iowa City	Orthopedic Surgery	1 year, arranged	110
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Injuries to Bones and Joints	Oct. 22 thr. Dec. 14, 1945 8 weeks	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Functional Anatomy in Relation to Orthopedics	Oct. 8 thr. Nov. 8, 1945 10 sessions	60
	Orthopedics in General Medicine	Oct. 15 thr. 20, 1945 6 days, full time	50
Washington State Medical Association, Committee on Post-Graduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital	Refresher Course in Orthopedics	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Orthopedics for Specialists	2 to 6 months, arranged	per month 100
OTOLOGY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Histopathy of the Ear	Oct. 23 thr. Dec. 4, 1945	50
	Clinical Otology	1 month, part time, arranged	40
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Operative Ear Surgery (Cadaver)	1 month, part time, arranged	110
	Anatomy of the Ear	1 month, part time, arranged	45
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Surgical Anatomy as Applied to Otology	Arranged, part time	per hour 10
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Anatomical Laboratory	Otologic (Cadaver) Operations	2 weeks, 20 hours Arranged	100
OTORHINOLARYNGOLOGY (See also Anatomy, Ophthalmology and Otology)			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Otolaryngology	2 weeks, every 2 weeks	50
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Broncho-Esophagology and Laryngeal Surgery	Oct. 15 thr. 27, 1945	100
	Refresher Course of Otolaryngology for Specialists	Sept. 24, 1945, 1 week	50
American Academy of Ophthalmology and Otolaryngology, 239-100 First Avenue Building, Rochester, Minn.	Home Study Course in Otolaryngology	Sept. 1, 1945 thr. May 1946	10
Washington University School of Medicine, Euclid Avenue and Kingshighway, St. Louis	Otolaryngology	Sept. 17, 1945. 8 months	600
Columbia University—At: New York Eye and Ear Infirmary, 218 Second Avenue, New York	Broncho-Esophagology	12 days full time or 6 weeks, part time, arranged	250
	Nasal Accessory Sinuses	1 month, part time, arranged	110
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Diagnostic Procedures in Otolaryngology	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 Part time, arranged	40 to 60
	Dissection of the Head and Neck	Oct. 1945 thr. Jan. 1946 Arranged	per hour 10
	Embryology, Histology and Pathology of Ear, Nose and Throat	Oct. thr. Nov. 1945 and Jan. 2 thr. June 30, 1946 15 sessions, part time	75
	Surgical Anatomy as Applied to Rhinology and Laryngology	Part time, arranged	per hour 10

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OTORHINOLARYNGOLOGY—Continued			
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Applied Anatomy of the Ear, Nose and Throat	80 hours, arranged	275
	Otolaryngologic Procedures	1 month, arranged	100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Head and Neck Dissection	6 weeks, arranged	150
	Otolaryngology (Clinical)	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	75
	Otolaryngology and Ophthalmology (Clinical)	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, full time	100
	Otolaryngology and Ophthalmology (also Cadaver)	Oct. 1, 1945 and Jan. 2, 1946 3 months, full time	600
Virginia Society of Ophthalmology and Otolaryngology, Box 1685, University Station, Charlottesville At: Medical College of Virginia, Richmond	Postgraduate Course in Otolaryngology	Dec. 1945, 2 days	30
University of Wisconsin Medical School, 418 North Randall Street, Madison	Otorhinology for Specialists	2 to 6 months, arranged	per month 100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia At: Anatomical Laboratory	Rhinolaryngologic (Cadaver) Operations	10 days, 20 hours Arranged	150
PATHOLOGY **(See also Medicine, Obstetrics and Gynecology, Ophthalmology and Otorhinolaryngology)**			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	General and Special Pathology	Oct. 22, 1945 thr. Jan. 31, 1946 15 weeks	45
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Gross and Microscopic Pathology	Sept. 17 thr. Oct. 26, 1945 6 weeks, part time	75
	Gynecological Pathology	Jan. 8 thr. Feb. 4, 1946 6 weeks, part time	75
	Pathological Physiology: Functional and Chemical Aspects	Oct. 1 thr. 5, 1945 5 days, full time	45
	Pathological Physiology: Functional and Chemical Aspects	Jan. 2 thr. Feb. 27, 1946 2 months, part time	130
	Pathology of the Blood and Blood Forming Organs	Nov. 2 thr. 30, 1945 4 weeks, part time	75
	Surgical Pathology	Sept. 18 thr. Dec. 27, 1945 15 weeks, part time	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Practical Laboratory Instruction in Pathology and Bacteriology	Arranged	Arranged
University of North Carolina School of Medicine, Chapel Hill, North Carolina	Pathology	Quarterly	per quarter 100
PEDIATRICS **(See also Allergy, Cardiovascular Diseases, Endocrinology, Neurology and Psychiatry, Obstetrics and Gynecology)**			
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago	Postgraduate Course in Pediatrics	Oct. 1 thr. 27, 1945 27 days	100
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Course in Pediatrics	2 weeks or 1 month, every 2 weeks	60-100
	Pediatrics	Sept. 17, 1945, 2 weeks	75
Tulane University of Louisiana School of Medicine, 1430 Tulane Avenue, New Orleans	Pediatrics	Dec. 10 thr. 14, 1945	25
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Pediatrics	Announced. 3, 6 or 12 days	15, 25, 50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Beth El Hospital	Clinical Pediatrics	Oct. 8, 1945 10 sessions, twice daily	20
At: Kings County Hospital	Heart Disease in Childhood	Oct. 19, 1945 10 sessions, once a week	20
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Clinical Pediatrics	Oct. 23 thr. Dec. 20, 1945 8 weeks	50
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Symposium on Recent Advances in Pediatrics	Oct. 8 thr. 13, 1945 6 days, full time	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Clinical Pediatrics	1 month, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Pediatrics	4 weeks, part time Arranged	50 Phys. in Serv. ½ fee
Southern Pediatric Seminar, Saluda, N. C.	Southern Pediatric Seminar	July 16 thr. 28, 1945 12 days	25
Medical College of Southwestern Medical Foundation, 2211 Oak Lawn, Dallas, Texas	Medicine and Pediatrics	2 months, arranged	75
University of Texas School of Medicine, 912 Avenue B, Galveston, Texas	Pediatric Refresher	Oct. 22 thr. 29, 1945 1 week	
Washington State Medical Association, Committee on Post-Graduate Medical Education, 218 Cobb Building, Seattle At: King County Hospital	Refresher Course in Pediatrics	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison	Pediatrics for Specialists	2 to 6 months, arranged	per month 100
PHARMACOLOGY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Pharmacology: Recent Advances in Therapy	Oct. 24 thr. Dec. 12, 1945 8 weeks	25
University of North Carolina School of Medicine, Chapel Hill, N. C.	Pharmacology (Therapeutics)	Quarterly	per quarter 100
PHYSICAL MEDICINE			
Northwestern University Medical School, 303 East Chicago Avenue, Chicago 11	Physical Medicine	1 month, arranged	None
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Physical Therapy	Oct. 23 thr. Dec. 13, 1945 8 weeks	35
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	General Course in Physical Medicine	4 weeks, part time Arranged	100 Phys. in Serv. ½ fee
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Physical Medicine	3 months daily Spring and Fall	200
University of Wisconsin Medical School, 418 North Randall Street, Madison	Physical Medicine for Specialists	2 to 6 months, arranged	per month 100
PHYSIOLOGICAL CHEMISTRY			
University of North Carolina School of Medicine, Chapel Hill, N. C.	Physiological Chemistry	Quarterly	per quarter 100

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
PHYSIOLOGY			
Wayne University College of Medicine, 1516 St. Antoine Street, Detroit	Seminar	July thr. Sept. 1945 1 hour weekly	
University of North Carolina School of Medicine, Chapel Hill, N. C.	Physiology	Quarterly	per quarter 100
POLIOMYELITIS			
Postgraduate School of Physical Therapy, Warm Springs Foundation At: Georgia Warm Springs Foundation, Warm Springs, Ga.	Treatment of Acute and Convalescent Poliomyelitis	First Monday of each month 5 consecutive days	None
University of Minnesota—At: University of Minnesota Center for Continuation Study, Minneapolis 14	Kenny Technique for Management of Infantile Paralysis	6 days, every other month	25
PROCTOLOGY **(See also Gastroenterology)**			
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	Proctology	Oct. 15, 1945 4 weeks, twice weekly	25
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Medical Proctology and Diseases of the Colon	Oct. 23 thr. Dec. 11, 1945 8 weeks	25
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Proctology	2 months, arranged	75
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Proctology	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	75
	Proctology (Cadaver) and Clinical Proctology and Gastroenterology	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, part time	200 Phys. in Serv. ½ fee
PUBLIC HEALTH **(See also Medicine)**			
University of Michigan School of Public Health, Ann Arbor	Public Health Economics	Announced. 3 days to 2 weeks	10
	Postwar Preparations for County and City Health Officers	Announced. 3 days	
University of Minnesota School of Public Health, Minneapolis 14	Public Health	Quarterly, 1 quarter	
University of North Carolina School of Public Health, Chapel Hill, N. C.	Public Health and Related Fields	1 quarter, arranged	100
RADIOLOGY **(See also Cardiovascular Diseases, Chest Diseases, Electrocardiography and Otorhinolaryngology)**			
American College of Radiology, 20 North Wacker Drive, Chicago 6 At: Various medical schools At: Philadelphia	Special Residencies	3 and 6 months, arranged	Arranged
	Postgraduate Course in Radiology	Fall, 1945. 2 weeks	
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Clinical Roentgenology	2 weeks, every 2 weeks	70
	Lecture and Clinical Roentgenology	2 weeks, every 2 weeks	125
	X-ray Therapy	2 weeks, every 2 weeks	110
Harvard Medical School Courses for Graduates, 25 Shattuck Street, Boston, 15 At: Boston City Hospital	General Roentgenology	July thr. Dec. 1945 Monthly. 1 month, mornings	50
At: Peter Bent Brigham Hospital	General Roentgenology	July thr. Dec. 1945 Monthly. 1 month, daily	100
University of Minnesota: At: University of Minnesota Center for Continuation Study, Minneapolis 14	Radiology	Announced. 3, 6 or 12 days	15, 25, 50
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Jewish Hospital	X-ray Diagnosis	Oct. 9, 1945 10 sessions, once weekly	25
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Montefiore Hospital	Advanced Cardiovascular Roentgenology	Jan. 2 thr. March 14, 1946 2 months, part time	40
	Advanced Roentgenology of the Thorax	Nov. 27, 1945 thr. Jan. 29, 1946 2 months, part time	40
	Elementary Cardiovascular Roentgenology	Oct 4 thr. Dec. 20, 1945 2 months, part time	50
	Elementary Roentgenology of the Thorax	Oct. 2 thr. Nov. 20, 1945 2 months, 1 day per week	40
	Supplementary Cardiovascular Roentgenology	Oct. 4 thr. Dec. 20, 1945 Jan. 3 thr. March 14, 1946 2½ months, part time	35
At: Columbia Presbyterian Medical Center	Radiological Physics	Jan. 9 thr. May 1, 1946 16 weeks	50
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Radiology	2 months, arranged	150
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Diagnostic Roentgenology and Radiotherapy (Advanced)	First of any month 6 weeks or 3 months, full time	150-300 Phys. in Serv. ½ fee
New York University College of Medicine, 477 First Avenue, New York	Radiology	Spring and Fall 3 month, 3 days a week	100
SURGERY **(See also Anatomy, Chest Diseases, Gastroenterology, Medicine, Ophthalmology, Otology, Otorhinolaryngology, Pathology and Proctology)**			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Gall-Bladder Surgery	June 25 thr. Oct. 1, 1945 1 week	100
	Surgery of Colon and Rectum	June 11, Sept. 10 and Nov. 5, 1945. 1 week	100
	Surgical Technique	2 weeks, every 2 weeks	200
	Thoracic Surgery	2 weeks, every 2 weeks	125
	Vaginal Approach to Pelvic Surgery	July 9 and Sept. 17, 1945 1 week	100
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Traumatic and Emergency Surgery	Nov. 5 thr. 10, 1945	25
Maine Medical Association, 142 High Street, Portland, Maine At: Boston	Refresher Course	1 to 2 weeks, arranged	Arranged
Wayne University College of Medicine, 1516 St. Antoine Street, Detroit	Chest Conference	July thr. Sept. 1945 1 hour weekly	
	Surgery Conference	July thr. Sept. 1945 1 hour weekly	
	X-ray Conference	July thr. Sept. 1945 1 hour weekly	

Postgraduate Continuation Courses for Practicing Physicians—July 1, 1945 to Jan. 15, 1946—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
SURGERY—(Continued)			
University of Minnesota. At: University of Minnesota Center for Continuation Study, Minneapolis 14	Surgery	Announced. 3, 6 or 12 days	15, 25, 50
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Surgery of Gastro-intestinal Tract	Oct. 22 thr. Nov. 16, 1945 4 weeks	150
At: Presbyterian Medical Center, Mount Sinai Hospital, New York Postgraduate Hospital, and Roosevelt Hospital	Symposium on General Surgery	Oct. 22 thr. 26, 1945 5 days, full time	75
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Blood Transfusion; Blood and Plasma Bank	Arranged, 12 hours	35
	Diagnosis and Management of Diseases of Liver and Gall Bladder	Nov. 7 thr. Dec. 19, 1945 7 sessions, part time	100
	Diagnosis and Treatment of Trauma	Oct. 22 thr. 27, 1945 6 days, full time	50
	Dissection and Surgical Anatomy	Oct. 1945 thr. Jan. 1946 24 hours	150
	Seminar in Traumatic Surgery	Sept. 24 thr. Oct. 6, 1945 11 days, full time	90
	Surgery of the Gastrointestinal Tract	Jan. 2 thr. March 27, 1946 13 sessions, part time	200
	Surgical Anatomy as Applied to Colon and Rectal Surgery	Oct. 1945 thr. Jan. 1946 12 hours, part time	100
	Surgical Anatomy as Applied to Thoracic Surgery	Oct. 1945 thr. Jan. 1946 12 sessions, part time	200
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York At: Flower and Fifth Avenue Hospitals and Metropolitan Hospital	Surgical Technique	Arranged. 75 hours	375
	Peripheral Vascular Disease	Arranged. 14 sessions	200
	Thoracic Surgery	Arranged. 36 hours	250
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York 19	Clinical and Operative (Cadaver) Surgery	Arranged. 6 weeks, full time	200
	Combined Surgical Course	Oct. 1, 1945 and Jan. 2, 1946 3 months, full time	350
	Surgical Operative Clinic and Lecture Course	Oct. 1, 1945 and Jan. 2, 1946 6 weeks, full time Phys. in Serv. ½ fee	100
Oklahoma State Medical Association, 210 Plaza Court Building, Oklahoma City At: Various areas throughout Oklahoma	Surgical Diagnosis	Arranged. 10 weeks	9
Meharry Medical College, 1005–18th Avenue North at Heffernan Street, Nashville, Tenn.	Office Surgery	October 1945. 1 week	20
Medical College of Southwestern Medical Foundation, 2221 Oak Lawn, Dallas, Texas	Surgery; Obstetrics and Gynecology	Arranged. 2 months	75
Washington State Medical Association, 218 Cobb Building, Seattle, Wash. At: King County Hospital, Seattle	Refresher Course in Surgery	Arranged	Arranged
University of Wisconsin Medical School, 418 North Randall Street, Madison At: Wisconsin General Hospital, Madison	Surgery Course for Specialists	Arranged. 2 to 6 months per month	100
	Postgraduate Course	Arranged. 12 weeks	125
	Observation Course in Medical and Surgical Subjects	Arranged. 1 to 5 months per month	100
THERAPY			
Columbia University Faculty of Medicine, 630 West 168th Street, New York At: Mount Sinai Hospital	Diagnosis and Therapy	Oct. 22 thr. Dec. 24, 1945 9 weeks	50
	General Bedside Therapy	Oct. 22 thr. Dec. 10, 1945 8 weeks	25
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Therapeutics	Arranged. 1 month	100
TROPICAL MEDICINE			
Tulane University of Louisiana School of Medicine, Department of Graduate Medicine, 1430 Tulane Avenue, New Orleans	Tropical Medicine	Jan. 2, 1946. 5 months	300
	Tropical Medicine and Parasitology	Dec. 10 thr. 21, 1945 2 weeks	50
University of Michigan School of Public Health, Ann Arbor, Mich.	Tropical Diseases	Announced. 3 days to 2 weeks	
Wayne University College of Medicine, 1516 St. Antoine Street, Detroit	Tropical Medicine and Parasitology	July thr. Sept. 1945 Twice weekly, part time	
Medical Society of Milwaukee County, 208 East Wisconsin Avenue, Milwaukee At: Marquette University School of Medicine	Tropical Diseases	Tuesday nights, 4 weeks	Nominal
UROLOGY **(See also Anatomy)**			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago 12	Urology and Cystoscopy	4 weeks, every 4 weeks	375
Long Island College of Medicine and the Medical Society of County of Kings and Academy of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Avenue, Brooklyn 2 At: Long Island College Hospital	Urology	First of each month 1 month or longer per month	25
Columbia University—At: New York Post-Graduate Medical School, 303 East 20th Street, New York 3	Advanced Course in Urology	Nov. 1 thr. Dec. 29, 1945 2 months, full time	250
Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Philadelphia 29	Female Urology	Arranged. 16 weeks 3 hours per week	100
University of Wisconsin Medical School, 418 North Randall Street, Madison	Course in Urology for Specialists	Arranged. 2 to 6 months per month	100
VENEREAL DISEASE **(See also Dermatology and Syphilology)**			
Bureau of Social Hygiene, New York City Department of Health, 125 Worth Street, New York At: Central Clinic	Postgraduate Course in Venereal Disease	Sept. 1945 thr. Jan. 1946 10 weeks	None
	Postgraduate Course in Diagnosis and Treatment of Venereal Disease	Fall 1945. 15 sessions	None
	Practical Seminar in Diagnosis, Treatment and Control of Venereal Disease	Arranged. 1 morning a week	None
University of Pennsylvania. At: Institute for Control of Syphilis, 3400 Spruce Street, Philadelphia	Applied Venereal Disease Epidemiology	Arranged. 3 months	Arranged
	Essential Basic Training Course	Arranged. 6 months	125
	Intensive Review Course	Arranged. 4 weeks	50
	Intensive Training Course in Venereal Disease Control	Arranged. 10 days	25
	Venereal Disease Review Course	Arranged. 3 weeks	35

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Lease of Space and Facilities to Physicians on Percentage of Physicians' Net Income Not the Practice of Medicine by Hospital.—The Temple Sanitarium, a corporation for profit, contracted in 1923 with Dr. J. M. Woodson to convey to him a parcel of land on which he was to erect, at his expense, a building, a part of which he was to use as an eye, ear, nose and throat clinic and a part of which was to be used by the corporation for general hospital purposes. The corporation agreed to send to Woodson all of its patients needing his specialized services and to reimburse to him 33⅓ per cent of the cost of the land and building he erected. In turn, the corporation was to be entitled to receive one third of the net income from the operation of the clinic. The contract was to continue in force until 1933. Woodson received title to the land and erected a building thereon, which was used for the purposes contemplated in the contract. Thereafter the corporate name of the Temple Sanitarium was changed to Scott & White Hospital. Woodson died in 1930 and his two sons, Drs. W. B. and B. P. Woodson, succeeded to his interest, the corporation waiving an option in the original contract permitting it to terminate the contract on Woodson's death. When the original contract, as supplemented, terminated in 1933, it was renewed until 1943, with an additional proviso that the corporation should have the option either to extend for ten years that contract when it expired in 1943 or to purchase the interest of the Woodsons. Shortly before expiration of the contract the corporation served notice on the Woodsons of its intention to purchase their interest under the terms of the contract. The Woodsons refused to comply, and Dr. W. B. Woodson filed a suit for partition against his brother, Dr. B. P. Woodson, and the corporation, asserting that each of the parties owned an individual one-third interest in the property and the building erected thereon. After institution of suit the defendant, Dr. B. P. Woodson, conveyed his interest to the corporation. The trial court denied partition and decreed specific performance of the contract in favor of the corporation against Dr. W. B. Woodson, who then appealed to the court of civil appeals of Texas.

Among other things, the plaintiff, Dr. W. B. Woodson, contended that the contract under which the corporation asserted the right to acquire his interest in the property was illegal and void because the corporation was engaged in the practice of medicine and surgery. At the trial to show that the corporation was engaged in the practice of medicine the plaintiff offered evidence that the corporation had collected medical fees during the twenty years the contract was in force and that the corporation apparently had physicians in its employ on a salary basis in connection with other medical services rendered in the portion of the building used by the corporation. He also sought to introduce in evidence a statement of the assets, liabilities and net proceeds of the corporation from its activities during the twenty year period. The trial court, however, excluded this evidence and the appellate court held that it acted properly. The present suit, said the appellate court, involves a specific written contract pertaining only to one specialized type and character of the medical and hospital services apparently being offered in the building in question—that of eye, ear, nose and throat practice. Whether or not the contract in question is ultra vires and whether or not the corporation thereby became engaged in the practice of medicine must be determined, as far as the suit on the contract is concerned, from the terms of the contract itself. Evidence as to what other contracts the corporation may have made with other physicians, how it may have operated other services in connection with the hospital it operated, what it paid other physicians engaged in services distinct and apart from the eye, ear, nose and throat clinic, and what profits and losses it may have made or suffered from the operation of other services are not admissible to test the validity of the specific contract sued on. The contract, being specific in all its terms as to the rights and duties of the parties thereto, must be interpreted and its validity determined according to its own provisions and not by what other contracts with other physicians relating to other services may have been.

Having reached that conclusion, the court did not deem it necessary to determine what constitutes the practice of medicine by a corporation. A corporation organized for profit, said the court, cannot practice medicine or employ physicians as its agents to do so for it. Obviously, under the medical practice act of Texas, a license to practice medicine can be issued only to a natural person. It is not controverted that all persons engaged in the operation of the Woodson eye, ear, nose and throat clinic, under the contract, were licensed physicians, and it is clear that Woodson and his associates under that contract were neither employees nor agents of the corporation. They were more in the nature of independent contractors and the percentage of the net proceeds collected by them and paid to the corporation was rather in the nature of rentals and as compensation to the corporation for services it rendered to the Woodsons in sending to them its patients needing specialized treatment and for otherwise caring for such patients. It is not controverted that the Woodsons were entirely independent of the corporation as to diagnosis, treatment of patients and operations to be performed, using their own judgment. They fixed and collected their own fees, kept their own books and accepted full responsibility to their patients for the nature and character of their services, and an express provision in the contract held the corporation harmless against any action or claim that might be made against it growing out of malpractice, negligence, unskilled service or mistreatment of any patient, employee or visitor by persons connected with the clinic. In brief, the Woodsons retained specifically the same relationship with, and responsibility to, their patients, whether such patients came to them of their own accord or were sent by the corporation, that they would have maintained had the contract not been made and as if the Woodsons had operated their specialized clinic on their own responsibility. Under the circumstances we think it clear that the Woodsons did not act as agents or employees of the corporation, that their acts were not the acts of the corporation, and that the corporation as such was not engaged, as far as the contract is concerned, in practicing medicine through them as agents. The judgment of the court in effect permitted the corporation to compel the plaintiff to convey his interest in the property to the corporation.—*Woodson v. Scott & White Hospital, 186 S. W. (2d) 720 (Texas, 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, June 30, page 688.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, Oct. 15-17. *Written.* Various centers, Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 27. Final date for filing application is Jan. 31. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, Philadelphia, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Fall, 1945. Final date for filing application is Aug. 1. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October 24. Final date for filing application is Aug. 1. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

14:233-264 (April) 1945

Acute Pharyngitis and Tonsillitis: Treatment with Sodium Sulfathiazole Gargle, with Experimental Studies on Extent of Absorption. B. H. Wiesel and R. S. Teague.—p. 234.
Treatment of Extensive Burns, with Report of Case. F. H. Chaddock Jr.—p. 236.
Planning for Medical Care in Postwar Period, with Particular Reference to Alabama. J. Newdorp.—p. 239.

14:265-284 (May) 1945

Intravenous Morphine. H. Smith and S. Schotz.—p. 265.
*Fox Rabies. H. N. Johnson.—p. 268.
Medical Practice of the Past. R. E. Hale.—p. 271.

Fox Rabies.—Johnson says that whenever fortuitous circumstances have allowed wild canine species such as the fox or coyote to become abundant in a region where rabies is enzootic in dogs there is a constant threat of a serious epizootic of rabies. The gray fox species has become unusually abundant in several of the Southern states. During the past seven years fox rabies has been reported in Alabama, Arkansas, California, Georgia, Illinois, Iowa, Indiana, Kansas, Kentucky, Louisiana, New York, Pennsylvania, North Carolina, South Carolina, Ohio, Tennessee, Texas, Virginia, West Virginia and Wisconsin. In certain areas where foxes were usually abundant true epizootics of rabies developed. In one county in which fox rabies was prevalent 2,900 dogs were vaccinated within a period of three weeks. Four dogs developed rabies after vaccination, all within a period of thirty days. It is probable that these dogs were exposed before vaccination. Fourteen foxes, later proved rabid, were killed by fox hounds which had been vaccinated, and none developed rabies. No further cases of rabies have developed among vaccinated dogs in this county. The author cites several other outbreaks of fox rabies. In most instances the actions of rabid foxes are quite characteristic. Foxes are normally timid and avoid human habitations; those killed while invading farm yards in daytime have consistently been proved rabid by laboratory examination. Of the fox specimens submitted to the Alabama State Health Department, 31 were reported positive for rabies in 1943 and 32 in 1944. Nine persons were known to have been bitten by rabid foxes in 1944. It is essential that action be taken to reduce the number of gray foxes in areas where rabies is present. It is not necessary or practical to attempt to exterminate foxes, but their number must be reduced to a level where contact infection from fox to fox will not be frequent enough to maintain rabies. For the protection of their dogs and of their sport, fox hunters should aid rather than oppose such control measures. It is important that the heads of foxes and other wild animals such as skunks and coyotes be sent to laboratories for examination, so that there will be definite evidence of the extent of the disease.

American Journal of Clinical Pathology, Baltimore

15:35-86 (Feb.) 1945

Mycetoma Pedis in United States and Canada, with Report of 3 Cases Originating in Louisiana. E. L. Burns, Emma S. Moss and J. W. Brueck.—p. 35.
Alveolar Cell Carcinoma of Lung. K. Ikeda.—p. 50.
Fibrocystic Disease of Pancreas: Study of 14 Cases. A. H. Baggenstoss and R. L. J. Kennedy.—p. 64.
Preliminary Study of Blood Chemistry Findings in Scrub Typhus. S. P. Gottfried.—p. 71.
Mechanism of Desensitization in Allergy. H. A. Heise.—p. 77.

Annals of Internal Medicine, Lancaster, Pa.

22:475-638 (April) 1945

Treatment of Subacute Bacterial Endocarditis with Penicillin. J. E. Paulin and C. J. McLoughlin.—p. 475.
Inhalation of Penicillin Aerosol in Patients with Bronchial Asthma, Chronic Bronchitis, Bronchiectasis and Lung Abscess: Preliminary Report. A. L. Baruch, F. H. Silberstein, E. T. Oppenheimer, T. Hunter and M. Soroka.—p. 485.
Penicillin Therapy at University of Minnesota Hospitals: 1942-1944. W. W. Spink and W. W. Hall.—p. 510.
Septic Pulmonary Infarction: Report of 8 Cases. H. H. Hussey and S. Katz.—p. 526.
Meningococcic Meningitis: Report of 165 Cases. A. H. Meyer.—p. 543.
*Infectious Mononucleosis: Study of 96 Cases. J. H. Press, E. L. Shlevin and A. P. Rosen.—p. 546.
Phlegmonous Gastritis as Manifestation of Sepsis. L. J. Sachs and A. Angrist.—p. 563.
Acute Plasma Cell Leukemia. L. M. Meyer, J. Halpern and F. N Ogden.—p. 585.

Infectious Mononucleosis.—Press and his associates report 96 consecutive sporadic cases of infectious mononucleosis observed at the Jewish Hospital of Brooklyn over a ten year period. Infectious mononucleosis is an acute benign infection of unknown etiology characterized by irregular fever, swelling of the lymph nodes, sore throat, splenomegaly and lymphocytosis with the presence of abnormal lymphocytes in the peripheral blood stream; the blood serum may contain antibodies against sheep erythrocytes in high titers. The disease has been described also under terms such as acute lymphadenosis with lymphocytosis, monocytic angina, lymphocytic angina, lymphatic reaction and glandular fever. Diagnosis of infectious mononucleosis is in order in the presence of a suspected clinical picture when the hematologic findings are positive. The blood smear has been the most constant and characteristic single laboratory feature in the recognition of this disease. A positive Paul-Bunnell test is strongly confirmatory, but its absence does not preclude the diagnosis. It is sometimes necessary to repeat this test before a positive reaction develops. Because of the extreme diversity of manifestations of infectious mononucleosis the diagnosis may go unrecognized unless the disease is borne in mind and appropriate laboratory procedures are carried out.

Archives of Otolaryngology, Chicago

41:247-318 (April) 1945

*Penicillin in Mastoiditis and Its Complications. F. J. Putney.—p. 247.
Mechanism of Cochlea. P. Kellaway.—p. 252.
Congenital Atresia of Posterior Nares: Descriptions of Technics Used in Meeting Operative Difficulties and Report of Case. H. M. E. Boyd.—p. 261.
Disturbed Vestibular Function: Causes and Cures. M. F. Jones.—p. 272.
*Effect of Sulfathiazole in Chewing Gum in Certain Oropharyngeal Infections: Preliminary Report. N. Fox, R. G. Kesel, E. R. Neary and R. H. Herbine.—p. 278.
Tumors of Trachea. W. S. Tinney, H. J. Moersch and J. R. McDonald. —p. 284.
Lymphoid Hyperplasia of Nasopharynx: Study of 131 Autopsy Specimens. A. R. Hollender and P. B. Szanto.—p. 291.

Penicillin in Mastoiditis and Its Complications.—Infections of the mastoid and contiguous structures can be readily controlled by penicillin, provided the causative organisms are sensitive to the drug. Sterilization of the blood stream and control of spreading infections can be accomplished by systemic administration of penicillin, but surgical intervention is usually necessary to effect a cure. Local application of the drug has proved beneficial in the healing of persistently draining mastoid wounds. Putney reports 10 cases, among them 1 each of cerebellar abscess, epidural abscess, mastoiditis, thrombosis of the lateral sinus, petrositis and meningitis. Sulfonamide compounds were administered in 8 of the 10 cases without clearing the infection, but prompt response was obtained from treatment with penicillin. Penicillin in combination with adequate surgical intervention offers the most effective means of combating serious and life endangering otologic complications.

Sulfathiazole in Chewing Gum for Oropharyngeal Infections.—Fox and his collaborators point out that effective topical application of sulfonamides to diseased oropharyngeal tissues has been difficult because certain factors prevented the maintenance of a satisfactory concentration of the drug. The smooth oral mucosa is continually washed by saliva and does not lend itself favorably to treatment by powders, ointments or solutions. Beneficial results from the local application of sulfon-

amide drugs in the mouth have been reported, but they occurred in such areas as the alveolus of an extracted tooth or a cavity in the maxilla or mandible where the drug was sheltered from swallowing and salivary dilution. The authors decided to use chewing gum as a vehicle. On the basis of their studies on this medium, they arrive at the following conclusions: 1. Chewing of gum appears to be a mouth cleansing process. 2. From the standpoint of minimal systemic toxicity and maximal local antibacterial potency, sulfathiazole in chewing gum seems to be the preferable local chemotherapy for infections of oral and pharyngeal mucosa which are susceptible to sulfonamide compounds. 3. Best clinical results are obtained in those conditions of the mouth and pharynx in which the beta hemolytic streptococcus is the preponderant etiologic organism.

Bulletin of Johns Hopkins Hospital, Baltimore

76:93-154 (March) 1945

*Multiple Congenital Arteriovenous Aneurysms in Pulmonary Circulation. J. H. Sisson, G. E. Murphy and E. V. Newman.—p. 93.
*Sulfamerazine in Treatment of Pneumococcal Lobar Pneumonia: Analysis of 292 Cases. A. Genecin, R. C. Austrian and R. A. Nelson.—p. 112.
*Therapeutic Value of Penicillin Applied Locally, Based on Experience with Crude Material in Variety of Infections. A. M. Fisher.—p. 134.

Multiple Congenital Arteriovenous Aneurysms in Pulmonary Circulation.—Sisson and his associates present the history of a woman aged 45 who had multiple congenital arteriovenous aneurysms in the pulmonary circulation. The diagnosis established by angiography was confirmed at necropsy. The clinical picture of 6 cases is summarized. The usual symptoms are weakness, faintness and dizziness, dyspnea, chest pain and hemoptysis. The signs are cyanosis, clubbing of the fingers, often visible hemangiomas, bruit over the chest, polycythemia and x-ray evidence of a localized opacity in the lung. The diagnosis can be established by angiography, but this procedure may be dangerous in a patient with a circulatory shunt from the right to the left side of the heart. The authors' patient died twenty-five minutes after the injection of diodrast. This substance should be approached with caution in cases of hypertensive cardiovascular disease. Treatment planned for the woman was pneumonectomy. This operation had been successfully performed in *2* cases.

Sulfamerazine and Lobar Pneumonia.—Genecin and his associates employed sulfamerazine either alone or in combination with antipneumococcus serum or penicillin in *292* cases and found it effective. Sulfamerazine, when given in daily dosages as small as 3 Gm. per day after initial larger doses, produces high and relatively stable blood levels which are adequate in most instances to control pneumococcic pneumonia. Toxic reactions were observed in 10.6 per cent of the patients. These reactions were of the type seen following sulfadiazine. No instances of peripheral neuritis were observed. A small group of patients with particularly severe pneumococcic pneumonia were treated with sulfamerazine and penicillin. The results were very encouraging.

Crude Penicillin Applied Locally.—Fisher treated 95 cases of various types of infections with crude penicillin locally. The results were good in 63 per cent, indefinite in 24 per cent and poor in 13 per cent. The lesions which have shown the best response were the more acute or subacute lesions in which the bacteria are superficial or chronic lesions following surgical drainage with removal of all dead tissue. Local penicillin therapy is not recommended to the exclusion of other methods but can be employed successfully in conjunction with its parenteral administration, with local surgical measures or with other antibacterial agents.

Gastroenterology, Baltimore

4:121-204 (Feb.) 1945

Gallbladder in Patients with Pernicious Anemia: Study of Nonvisualization and Rate of Emptying. E. A. Boyden and J. A. Layne.—p. 121.
Acidity of Duodenal Contents in Health and Disease: Review of Clinical Investigations. M. W. Comfort.—p. 135.
Epidemic Infectious Hepatitis. E. Wayburn.—p. 147.
Statistical Evaluation of Amebiasis. D. C. Browne, G. McHardy and M. A. Spellberg.—p. 154.
Effect of Liver Disease on Vitamin Metabolism. D. Adlersberg, H. Sobotka and B. Bogatin.—p. 164.
Secretion of Hydrochloric Acid by Stomach. H. B. Bull and J. S. Gray.—p. 175.

Hawaii Medical Journal, Honolulu

4:179-204 (March-April) 1945

Hyperventilation Syndrome. J. J. Short.—p. 179.
Acute Yellow Atrophy Caused by Sulfathiazole: Report of Case. H. C. Gotshalk.—p. 185.
Influenzal Meningitis: Case Report. J. G. Cutler and J. M. Partain.—p. 187.
Erythroblastosis Fetalis in Chinese Infant with an Rh Positive Mother. I. L. Tilden and W. K. Chang.—p. 189.

Illinois Medical Journal

87:165-216 (April) 1945

Rheumatic Fever as Public Health Problem. J. J. Sievers.—p. 181.
Rheumatic Fever in Childhood. H. W. Elghammer.—p. 187.
Treatment of Rheumatic Syndrome. P. Rosenblum.—p. 189.
Diagnosis and Treatment of Carcinoma of Fundus Uteri. H. E. Schmitz, J. F. Sheehan and J. E. Towne.—p. 194.
Vesicovaginal Fistula. C. W. Trowbridge.—p. 197.
Malignant Carcinoid (Argentaffinoma) of Ileum with Widespread Metastases. J. A. Tuta.—p. 200.

Journal of Clinical Investigation, Boston

24:127-250 (March) 1945. **Partial Index**

Effect of Environmental Temperature on Experimental Traumatic Shock in Dogs. R. A. Ricca, K. Fink, L. I. Katzin and S. L. Warren.—p. 127.
Thiamine-Deficient Diet in Tourniquet Shock in Rats. L. I. Katzin and S. L. Warren.—p. 152.
Study of Body Temperature and Water Content in Shock Produced by Continuous Intravenous Injection of Adrenalin, With and Without Anesthesia. D. E. Scholz, J. H. Schultz, F. G. Pleune, K. Fink, L. T. Steadman and S. L. Warren.—p. 154.
Agglutinin Response in Patients with Meningococcic Meningitis. H. F. Dowling, R. L. Mayer, L. K. Sweet and Edith Dumoff-Stanley.—p. 160.
Bacteriostatic and Lytic Actions of Penicillin on Sensitive and Resistant Staphylococci. W. M. M. Kirby.—p. 165.
Properties of Penicillin Inactivator Extracted from Penicillin-Resistant Staphylococci. W. M. M. Kirby.—p. 170.
Experimental Attempt to Transmit Primary Atypical Pneumonia in Human Volunteers. J. H. Dingle and others.—p. 175.
Effects of Testosterone and of Testosterone Propionate on Renal Functions in Man. C. Klopp, N. F. Young and H. C. Taylor Jr.—p. 189.
Influenza Virus Isolations and Serologic Studies Made in Boston During Winter of 1943-1944. M. Finland, Mildred W. Barnes and B. A. Samper.—p. 192.
Studies on Primary Atypical Pneumonia. E. C. Curnen, G. S. Mirick, J. E. Ziegler Jr., L. Thomas and F. L. Horsfall Jr.—p. 209.

Journal of Nutrition, Philadelphia

29:223-288 (April) 1945

Basal Metabolic Rate of American Negro, with Particular Reference to Effect on Menstruation of Female. U. S. Maxwell and G. Wakeham.—p. 223.
Studies of Calcium and Phosphorus Metabolism in Chick: III. Some Time Relationships in Action of Vitamin D. E. W. McChesney and N. J. Giacomino.—p. 229.
Studies on Comparative Nutritive Value of Fats: V. Growth Rate and Efficiency of Conversion of Various Diets to Tissue in Rats Weaned at 14 days. H. J. Deuel Jr. and E. Movitt, with technical assistance of Evelyn Brown.—p. 237.
Studies on Carotenoid Metabolism: V. Effect of High Vitamin A Intake on Composition of Human Milk. M. Caroline Hrubetz, H. J. Deuel Jr. and B. J. Hanley, with technical assistance of Martha Fairclough.—p. 245.
Relationship of Glyceride Structure to Fat Digestibility: I. Synthetic Glycerides of Stearic and Oleic Acids. K. F. Mattil and J. W. Higgins.—p. 255.
Studies on Bone Fracture Healing: I. Effect of Vitamins A and D. D. H. Copp and D. M. Greenberg.—p. 261.
*Effect of Soy Flour on Nutritive Value of White Bread. Frances E. Volz, R. M. Forbes, W. L. Nelson and J. K. Loosli.—p. 269.
Sulfur Balance of Nonlaying, Molting and Laying Hen. R. T. Holman, M. W. Taylor and W. C. Russell.—p. 277.
Availability of Vitamins in Foods and Food Products: II. Riboflavin Balances in Dried Liver, in a Liver Vitamin Concentrate and in Brewers' and Bakers' Yeast. B. Sure, with technical assistance of L. Easterling.—p. 283.

Effect of Soy Flour on Nutritive Value of White Bread.—Volz and her associates state that the addition of 15 or 20 per cent of soy flour significantly improves the protein quality of bread, but the product is so different from white bread that it is not accepted by the average consumer. Since 5 per cent of soy flour can be used without appreciably altering the appearance or flavor of white bread, it seemed of interest to determine whether such an addition would improve the protein quality. In a study on rats the authors found that the addition of 5 per cent soy flour significantly improves the growth promoting value of white bread which contains 3 per

cent of whole milk solids. White bread containing 3 per cent of milk solids gave 0.97 Gm. gain per gram of protein consumed and bread with 5 per cent soy flour, containing an equal amount of milk, 1.17 Gm.; this difference is significant. The biologic value of the protein of the white bread as determined by the Mitchell method was 43.3 as compared with 47.7 for the bread with 5 per cent soy flour.

Journal of Pediatrics, St. Louis

26:313-414 (April) 1945

Crying of Newly Born Babies: I. The Community Phase. C. A. Aldrich, C. Sung and Catharine Knop.—p. 313.
Fels Composite Sheet: I. Practical Method for Analyzing Growth Progress. L. W. Sontag and E. L. Reynolds.—p. 327.
Id.: II. Variations in Growth Patterns in Health and Disease. E. L. Reynolds and L. W. Sontag.—p. 336.
Late Behavioral Aspects Found in Cases of Prenatal, Natal and Postnatal Anoxia. Mary I. Preston.—p. 353.
Value of Serum Protein Determinations in Cases of Suspect Erythrodermia Desquamativa of Newborn. K. Glaser and S. M. Markson.—p. 367.
Roentgentherapy of Hemangioma of Larynx in Infants. H. H. Kasabach and C. P. Donlan.—p. 374.
Significance of Delayed Ossification in Treatment of Congenital Clubfoot. D. W. Leonard.—p. 379.
Paracolon and Proteus Bacilli in Feces of Healthy Infants. E. Neter.—p. 390.
Ingestion of Kerosene Complicated by Pneumonia, Pneumothorax, Pneumopericardium and Subcutaneous Emphysema. A. F. Lavenstein.—p. 395.
Accidental Hanging with Recovery: Report of 2 Cases in Children. Mildred Kemper and S. Gibson.—p. 401.
Pneumococcus Meningitis in Newborn: Report of Case with Recovery and Review of Literature. P. Hogg and C. D. Bradley.—p. 406.

Journal of Thoracic Surgery, St. Louis

14:83-186 (April) 1945

*Difficulties in Differential Diagnosis of Bronchogenic Carcinoma. R. G. Bloch, W. E. Adams, T. F. Thornton and J. E. Bryant.—p. 83.
Bronchial Adenoma. C. L. Jackson, F. W. Konzelmann and C. M. Norris.—p. 98.
*Problem of So-Called Bronchial Adenoma. E. A. Graham and N. A. Womack.—p. 106.
*Hamartoma (Often Called Chondroma) of Lung. J. R. McDonald, S. W. Harrington and O. T. Clagett.—p. 128.
Bronchial Adenoma Treated by Pulmonary Resection: Case Reports. J. M. Chamberlain and J. Gordon.—p. 144.
New Guide in Operation for Esophageal Hiatus Hernia of Diaphragm. P. E. Truesdale.—p. 160.
Thoracoplasty Binder. E. F. Skinner.—p. 171.
Use of Whole Blood Transfusion in Resections of Lung. T. F. Thornton Jr., W. E. Adams, J. E. Bryant and L. M. Carlton Jr.—p. 176.

Diagnosis of Bronchogenic Carcinoma.—Bloch and his associates say that, through routine chest fluoroscopy of all patients of the outpatient department of the University of Chicago Clinics, bronchogenic carcinoma in the early and nonsymptomatic stage, as well as advanced tumors unrelated to the patients' complaints, are found in appreciable numbers. The differential diagnosis in early cases is frequently difficult and cannot be established by the conservative methods of examination but only by surgical exploration. X-ray examination can never establish a definite differential diagnosis even in extensive involvements. Particular diagnostic difficulties are offered by excavated lesions which are not accessible to the bronchoscope. Extrapulmonary involvements and systemic disease frequently confuse and obscure the picture of carcinoma. The absence of tubercle bacilli from the sputum eliminated by excavating lesions is most significant in the diagnosis of neoplasm.

So-Called Bronchial Adenoma.—Graham and Womack stress that the so-called bronchial adenoma must be regarded as a potentially malignant tumor. Although it may pursue a nonmalignant course for many years, there always remains the possibility of the appearance of malignant qualities, such as invasion of neighboring structures, involvement of regional lymph nodes and the development of distant metastases. The authors cite a case in which there was a combined carcinoma and sarcoma with the presence of bone. The malignant transformation of both the epithelial and the connective tissue elements in this case seems to support the suggestion made by the authors in 1938 that a wide variety of tumors can be thought of as arising from a fetal bronchial bud which has failed either to develop normally or to atrophy. At that time they offered the conception that either the mesodermal or the entodermal elements could be the origin of later neoplastic growth which could include not only such recognized pulmonary tumors as chondroma, fibroma, lipoma and sarcoma but also the so-called adenoma, which is composed predominantly of entodermal or epithelial elements. It is rare, however, to find malignant transformation of the two elements in the same tumor. The presence of bone in this case, the authors feel, is in line with their conception that "mixed tumors" is a better designation for these tumors than "adenoma." The frequent inability to determine from a biopsy specimen whether or not the tumor has already become malignant makes the attempt at local removal through the bronchoscope both unwise and dangerous. Total pneumonectomy is the procedure of choice.

Hamartoma of Lung.—According to McDonald and his associates three benign pulmonary tumors, which were strikingly similar and unusual, were removed at the Mayo Clinic in the past three years. All tissues in these tumors corresponded with those found normally in the bronchi, although lacking in orderly arrangement. Such neoplasms are supposed to be the result of abnormal development of the bronchial anlage; therefore they have been called hamartomas (to fail, to err). This paper is based on a study of 23 cases of hamartoma of the lung. In 3 of these the tumor was removed surgically. In the remaining 20 cases the tumor was discovered at necropsy. The incidence of hamartoma of the lung in a consecutive series of 7,972 necropsies was 0.25 per cent. This tumor occurs more frequently than has been recognized. It is strictly benign and only occasionally causes symptoms. In most cases the diagnosis has to be made by roentgenographic examination. A hamartoma should be suspected in every case of solitary lesion of the lung. Frequently this tumor cannot be distinguished from other lesions of the lung until a specimen of the tumor is examined microscopically. Treatment consists in excision of the tumor. One should try to conserve as much pulmonary tissue as possible.

Minnesota Medicine, St. Paul

28:257-336 (April) 1945

Postwar Medicine in Minnesota—The Doctor. B. O. Mork Jr.—p. 281.
Postwar Medicine in Minnesota—Diagnostic Centers. A. H. Zachman.—p. 284.
Spontaneous Subarachnoid Hemorrhage. R. B. Radl.—p. 286.
Neuropsychiatric Viewpoint of Socialized Medicine. E. M. Hammes.—p. 290.
Electroshock Therapy in State Hospital. M. W. Kemp.—p. 294.

New England Journal of Medicine, Boston

232:463-490 (April 26) 1945

*Treatment of Bacterial Endocarditis with Penicillin: Experiences at Boston City Hospital During 1944. M. Meads, H. W. Harris and M. Finland, with technical assistance of Clare Wilcox.—p. 463.
New Pocket Prismatic Microscope. D. J. O'Brien.—p. 475.
Clinical Importance of Rh Blood Type. L. K. Diamond.—p. 475.

Penicillin in Bacterial Endocarditis.—Meads and his associates present observations on 9 cases of subacute bacterial endocarditis caused by Streptococcus viridans and on 7 proved or probable cases of acute bacterial endocarditis due to other organisms, all of which were treated with sodium penicillin at the Boston City Hospital during 1944. In the 9 subacute cases the dose generally used was 25,000 units intramuscularly every two hours for two weeks. Seven of the patients are alive and have been free from evidences of active infection for one to eleven months. Two patients had recurrence of infection, 1 after four months and the other after only one month. It is not certain whether or not these recurrences represent reactivation of the original infection or reinfection. An additional fatal case of Streptococcus viridans endocarditis was treated. Improvement occurred in another extremely severe case with a characteristic clinical course of subacute bacterial endocarditis with multiple emboli, with survival three months after treatment, but no bacteria could be grown from the blood before penicillin was started. In the fatal cases heart failure resulted from extensive damage to cardiac structures. In the 7 cases of acute bacterial endocarditis small doses were generally used because of the greater susceptibility of the organisms. Three of these patients are living and well. The diagnosis in all the fatal cases was confirmed at necropsy but in those who survived it is only

highly probable. Heparin was used together with penicillin in 3 of the Streptococcus viridans cases and in 2 of those due to the pneumococcus. There appeared to be no benefit from this therapy to justify the additional effort and risk. Early and intensive treatment with penicillin maintained for an adequate period offers the best hope for recovery or arrest of infection in cases of subacute and acute bacterial endocarditis.

New York State Journal of Medicine, New York

45:817-928 (April 15) 1945

Sigmoiditis. A. Bassler.—p. 861.
*Gross Intracerebral Hematomas: Report of 16 Surgically Treated Cases. W. B. Hamby.—p. 866.
Practical Experience with Congenital Heart Disease. H. Green.—p. 877.
Factors Contributing to Failures in Biliary Tract Surgery. R. P. Dobbie. —p. 882.
Trauma in Relation to Peptic Ulcer. I. Gray.—p. 887.
Intestinal Helminths in New York and Vicinity. H. W. Brown.—p. 893.
Augmentation of Stilbestrol Effect in Menopausal Women by Vitamin C. L. Bonin.—p. 895.

Surgical Treatment of Intracerebral Hematomas.—Hamby says that, while the more common types of intracranial hemorrhage are well known, spontaneous, limited, removable intracerebral hematomas are less familiar. He reports 16 cases of gross intracerebral hematomas that were drained. There were 14 recoveries and 2 deaths. Cases due to cranial injury with skull fracture have not been included in this series. One of the two deaths was due to massive pulmonary atelectasis and the other to a fatal recurrent hemorrhage from a ruptured aneurysm of a major cerebral vessel. Seven of the cases were associated with cerebral arterial disease and 5 with intracerebral neoplasms (3 metastatic, 1 meningioma and 1 astrocytoma). One case was proved and 3 were suspected to be due to ruptured aneurysms of the major blood vessels. One case was of delayed post-traumatic intracerebral hemorrhage.

Pennsylvania Medical Journal, Harrisburg

48:657-752 (April) 1945

Avoidance of Difficulty in Biliary Surgery. H. E. Pearse.—p. 679.
Evaluation of Fenestration Operation for Otosclerosis. K. M. Day. —p. 684.
Treatment of Urinary Frequency in Women. W. Baurys.—p. 687.
American Medicine Tomorrow. M. F. Cabal.—p. 691.
Management of Epibulbar Malignancy. W. E. Fry.—p. 694.
Organization and Administration of Gynecologic Tumor Clinic, with Certain Observations Concerning Therapy. C. T. Beecham and T. L. Montgomery.—p. 697.

Radiology, Syracuse, N. Y.

44:319-424 (April) 1945

Roentgenologic and Pathologic Aspects of Pulmonary Tumors Probably Alveolar in Origin: Report of 6 Cases, 1 of Them Complicated by Torulosis of Central Nervous System. E. F. Geever, H. R. Carter, K. T. Neubuerger and E. A. Schmidt.—p. 319.
Roentgen Features of Eosinophilic Infiltrations in Lungs. H. Hennell and M. L. Sussman.—p. 328.
*Chronic Massive Pericardial Effusion Following Roentgen Therapy for Carcinoma of the Breast: Case Report. H. Blumenfeld and S. F. Thomas.—p. 335.
Observations on Over 100 Cases of Myelogenous and Lymphatic Leukemia, with Blood and Sternal Puncture Studies and Follow-Up of Several Years. B. Friedmann and L. M. Meyer.—p. 341.
Ileocecal Tuberculosis. M. R. Camiel.—p. 344.
Simple Method of Cardiac Measurements. F. Brunn.—p. 352.
Pes Planus: Method of Mensuration. M. Kaplan and M. Symonds. —p. 355.
Comparison of Physical and Biologic Methods of Depth Dose Measurement. C. Packard and F. M. Exner.—p. 357.
Measurements of Surface and Depth Dose Ratios from 70 to 1,000 Kv. F. M. Exner and C. Packard.—p. 367.

Chronic Pericardial Effusion Following Roentgen Therapy.—Blumenfeld and Thomas report the history of a woman aged 53 who presented herself with masses in the left breast and axilla. She was given within four days three doses of x-rays totaling 600 roentgens to a field including the left breast and axilla, also a single dose of 300 roentgens to the posterior axilla. Several days later a radical mastectomy was done. During the operation the patient was exposed to a dose of approximately 3,600 roentgens in air for the purpose of "sterilizing" residual cancer cells at the operative site. The x-rays were directed into the open wound, which was then closed. She was discharged following an uneventful recovery. Several months later the patient complained of cough with some tightness in the left shoulder and pain down the left arm. X-ray examination showed a shadow interpreted as roentgen pneumonitis. Six months later she reported abdominal distress. During the succeeding year she lost 25 pounds (11 Kg.), and cough and abdominal discomfort persisted. At the end of the year, in October 1941, exertion dyspnea was observed for the first time. All the symptoms persisted for the following two years, and in February 1944 the patient reentered the hospital with symptoms of myocardial damage. She died several weeks later. From the necropsy studies it was concluded that the remarkable thickening of the pericardium was probably the result of the unusually intense irradiation of this region at the time of the left mastectomy. The mechanical interference with the heart movement was the principal cause of circulatory failure and the final illness. The left lung was extensively collapsed, presumably as a result of irradiation. The literature abounds with references to the changes in the myocardium following irradiation, but heretofore only passing mention has been made of the effects of irradiation on the pericardium. Massive irradiation of the open thorax is not to be recommended.

Rocky Mountain Medical Journal, Denver

42:241-328 (April) 1945

Pulmonary Emphysema: Newer Concepts. E. Mayer and I. Rappaport. —p. 257.
Surgical Treatment of Funnel Chest. R. Nissen.—p. 264.
Reconstructive Surgery of War Wounded. P. D. Wilson.—p. 267.
Light and X-Ray Therapy of Tuberculosis. E. Mayer.—p. 274.
Conservative Operation of Air Cysts of Lung. R. Nissen.—p. 282.

42:329-408 (May) 1945

Tropical Otitis. I. W. Philpott and J. Chessen.—p. 345.
Postoperative Pulmonary Complications. V. L. Rees.—p. 347.
Need for Improvement in Medical and Psychiatric Concepts. F. G. Ebaugh.—p. 352.
Epidemic Encephalitis in Colorado. W. C. Black, W. K. Absher and J. G. McDonald.—p. 354.

Surgery, St. Louis

17:1-640 (April) 1945

*Acute Pancreatitis. J. Morton.—p. 475.
Investigation of Cause and Prevention of Gas Pains Following Abdominal Operation. H. H. Davis and T. M. Hansen.—p. 492.
Gastric Resection for Certain Acute Perforated Lesions of Stomach and Duodenum, with Diffuse Soiling of Peritoneal Cavity. J. D. Bisgard. —p. 498.
Survival After Gastric Resection in Carcinoma of Stomach. W. C. Custer.—p. 510.
Creation of Gastric Pouch Following Total Gastrectomy. G. C. Engel. —p. 512.
Prolonged Spinal Anesthesia: Description of Simplified Technic for Nupercaine. D. A. Roman-Vega and J. Adriani.—p. 524.
Pulmonary Complications Following Appendectomy and Herniorrhaphy. F. Hughes and S. S. Lambeth.—p. 533.
Cardiovascular Disturbances Following Pneumonectomy: Attempt to Correlate Blood Pressure and Intrapleural Pressure Changes. W. D. Seybold and O. T. Clagett.—p. 538.
Tuberculous Abscess of Thyroid Gland. K. P. Klassen and G. M. Curtis.—p. 552.
*Intrasternal Infusions and Transfusions. C. Reich, M. Y. Swirsky and E. Hunter.—p. 560.
Trench Foot. F. K. Boland Jr., T. S. Claiborne and F. P. Parker. —p. 564.
Observations on Treatment of Empyema Thoracis with Penicillin. B. Blades, J. E. Hamilton and D. J. Dugan.—p. 572.
Complicating Factors in Surgical Management of Varicose Veins, with Special Reference to Interruption of Sympathetic Nerve Impulses as an Adjunct in Treatment. H. G. Smithy.—p. 590.
Clinical Anatomy of Vertebral Veins. M. Norgore.—p. 606.
Homogenous Cartilage Grafts: Experimental Study. F. Young.—p. 616.
Traumatic Chylothorax: Report of Fatal Case Complicated by Ruptured Duodenal Ulcer. R. Florer and A. Ochsner.—p. 622.
Total Colectomy for Polyposis of Colon with Carcinomatous Degeneration, with Note on Postoperative Care. A. O. Wilensky.—p. 630.

Acute Pancreatitis.—Morton stresses that pancreatitis must be considered as a possibility in patients complaining of sudden severe epigastric pain. The serum amylase test is of greatest assistance in deciding whether the pancreas is involved. The test is easily carried out, is accurate and gives more important information than any of the routine laboratory tests. The author thinks that as long as surgeons operate without using the amylase test to help in their diagnosis there will be a mortality from acute edematous pancreatitis. Before the amylase

test was available and operation was necessary to decide the diagnosis, the author had 9 fatalities in 22 cases of pancreatitis. With the proper use of the amylase test he treated 29 cases of pancreatic edema without a death, not operating during the height of the reaction. There are two types of pancreatitis, acute edematous and pancreatic necrosis. Acute edematous pancreatitis can be diagnosed by the serum amylase test and the rapid improvement under conservative treatment. Pancreatic necrosis must be suspected when the patient fails to make improvement within a few days. In acute edematous pancreatitis operation should be deferred until the reaction has subsided. Acute edematous pancreatitis is followed frequently by chronic pancreatitis. Pancreatic necrosis is followed by abscess, diabetes and pseudocysts in some of those who survive. Conservative treatment of pancreatic necrosis or pancreatic abscess is disastrous. When either condition is suspected, operation is indicated. Biliary tract disease should be treated after an acute attack of pancreatitis if it has played a part in the onset. Any surgical manipulation about the lower end of the common duct or the head of the pancreas is likely to be followed by postoperative acute pancreatic edema. This can be demonstrated by the amylase test. There is a considerable danger of this in the resection of posterior duodenal ulcer perforating into the pancreas. It carries a mortality which should be taken into consideration in resections of duodenal ulcer.

Intrasternal Infusions and Transfusions.—Reich and his associates show that when shock is brought about by wounds, hemorrhage or burns there is usually urgent need for the parenteral administration of fluids. These fluids can usually be given by vein, but in some instances the veins are collapsed, thrombosed or absent or the vein areas are obliterated by wounds or burns. The bone marrow offers a ready channel for the administration of fluids in these cases. The present report is a study of the administration of various fluid mediums through the sternal marrow. The work was done on 35 patients in the general wards of a large city hospital. The authors conclude that intrasternal infusions of saline solution, glucose and plasma are practical, but the intrasternal transfusions of blood were unsuccessful. The sternal route is of great value in the treatment of shock.

Texas State Journal of Medicine, Fort Worth

40:621-672 (April) 1945

Choice of Treatment in Cancer. O. T. Woods.—p. 627.
Pruritus Vulvae: Twelve Year Study. K. J. Karnaky.—p. 630.
Advances in Treatment of Various Forms of Meningitis. R. L. Moore. —p. 637.
Spontaneous Fractures of Ribs in Healthy Individuals. T. B. Bond. —p. 642.
Malignant Tumors of Testis. C. H. Frank.—p. 643.
Treatment of Ocular Injuries Among Combat Troops. F. M. Whitsell. —p. 646.
Carotid Cavernous Arteriovenous Aneurysm. C. E. Ball.—p. 653.

United States Naval Med. Bulletin, Washington, D. C.

44:681-900 (April) 1945. **Partial Index**

Bacterids Provoked by Internal Sulfonamide Administration. C. C. Carpenter and P. L. Gorsuch.—p. 681.
Abuse of Sulfonamides in Treatment of Acute Catarrhal Fever. R. A. Kern.—p. 686.
Salivary Sulfonamide Levels After Chewing Paraffin and Chicle Vehicles. C. C. Pfeiffer and Helen L. Holland.—p. 695.
Sulfadiazine as Prophylactic Agent Against Meningitis. E. R. Garvin. —p. 700.
Skin Reactions to Dirofilaria Immitis Extract. R. W. Huntington Jr. —p 707.
Filariasis: Study of 737 Patients So Diagnosed. F. R. Smith Jr.—p. 719.
Intestinal Parasites Among Melanesians. H. K. Russell and J. O. Scott. —p. 727.
Large Scale Isolation and Identification of Shigella Organisms in Field. R. W. Getty and others.—p. 729.
Positive Dick Test Reactors: Relation of Incidence to Habitat. M. J. H. Grand and J. D. Purvis Jr.—p. 734.
Certain Psychiatric Reactions in Operators of Antisubmarine Sound Gear: Report of 2 Cases. O. A. Will Jr.—p. 746.
Experiences with Group Psychotherapy. J. D. Teicher.—p. 753.
Treatment of Atelectasis. E. C. Thompson.—p. 757.
Treatment of Empyema. B. Battaglia.—p. 763.
Mistakes in War Surgery. F. H. Bowen.—p. 777.
Medical Problems in Construction Battalion. J. L. Hurlbut.—p. 793.
Statistical Report of Malaria During One Year on Island X. C. D. Fowler, D. M. Roberts and E. D. Dillon.—p. 797.
Gingivitis Among Submarine Personnel: Comparative Study. O. E. Van Der Aue and V. R. Cullen.—p. 811.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

67:141-272 (Sept.) 1944

*Pressure Effects Associated with Cervical and with Rudimentary and "Normal" First Ribs, and Factors Entering into Their Causation. F. M. R. Walshe, H. Jackson and R. Wyburn-Mason.—p. 141.
Electrical Activity of Voluntary Muscle in Man Under Normal and Pathologic Conditions. G. Weddell, B. Feinstein and R. E. Pattle. —p. 178.
Familial Tuberose Sclerosis with Calcification: Report of 2 Cases. L. J. Apley.—p. 258.
Creatine Metabolism in Relation to Pituitary Tumor. J. N. Cumings. —p. 265.

Pressure Effects of Cervical and Normal First Rib.—Walshe and his associates present 5 cases of cervical and rudimentary first rib pressure. When an abnormal rib is present it is rarely the only relevant skeletal abnormality, for scoliosis and vertebral deformities are commonly associated with it. The bony abnormality consists of an abnormal upper thoracic outlet. This outlet is commonly asymmetrical and abnormally raised and tilted. The associated nervous and vascular symptoms are not accounted for by the abnormal rib alone, for there is evidence that the clavicle plays an important part in the compression of nerve roots and artery. The clavicle and the abnormal rib form the two arms of a vise in which these structures are compressed. This view does not exclude the role of a rib in exerting traction on and stretching and bending of the structures which cross it. Damage to the subclavian artery may lead to its aneurysmal dilatation, with or without the formation of clot within it. Thrombosis, when it occurs, leads to severe ischemia in the upper limb and sometimes to the production of emboli which lodge in the digital arteries and give rise to gangrenous patches, sometimes erroneously attributed to disorders of sympathetic innervation. Vascular symptoms in the upper limb are not due to disorders of sympathetic innervation but to mechanical interference with the blood flow through the subclavian artery. When symptoms of sympathetic paralysis occur, they are referable to the stellate ganglion. Of the components of the syndrome of a paralyzing lesion of this ganglion, Horner's oculopupillary syndrome is the most familiar. The factors leading to pressure symptoms affecting nerves and artery when no abnormal costal element is present, the so-called normal first rib and scalenus anticus syndromes, are discussed. Perhaps the essential factor is a dropping of the shoulder girdle. This leads to increased tension on nerve roots and subclavian artery and, by narrowing the space between first rib and clavicle, may lead to the compression of these structures by the clavicle during movements of the arm. The need for a more systematic x-ray study of the upper thoracic outlet in cases of suspected rib pressure is stressed.

Journal of Mental Science, London

90:1-152 (Jan.) 1945

Serum Gonadotropin and Testis Biopsy in Treatment of Schizophrenia. R. E. Hemphill and M. Reiss.—p. 1.
Factorial Study of Some Morphologic and Psychologic Aspects of Human Constitution. W. L. Rees and H. J. Eysenck.—p. 8.
Character Assessment from Handwriting. Olga Marum.—p. 22.
Account of Lowenfeld Technic in Child Guidance Clinic, with Survey of Therapeutic Play Technic in Great Britain and U. S. A. P. M. Traill.—p. 43.
Clinical and Biochemical Analysis of Case of Manic-Depressive Psychosis Showing Regular Weekly Cycles. R. Klein, M. D. Prague and R. F. Nunn.—79.
Physique and Effort Syndrome. W. L. Rees.—p. 89.
Vestibular Reactivity to Caloric Stimulation in Schizophrenics: Preliminary Report. G. Fitzgerald and E. Stengel.—p. 93.
Electric Convulsion Treatment in Patients Over 60. W. Mayer-Gross. —p. 101.
Syndrome of Hysteroencephalopathy in Military Psychiatric Casualties. G. T. Stockings.—p. 104.
*Schizophrenia in Military Psychiatric Practice. G. T. Stockings.—p. 110.
Delinquent Defectives. H. J. Ehrenwald.—p. 113.
Comments on Shipley-Hartford Vocabulary Test. E. J. G. Bradford. —p. 119.

Schizophrenia.—Stockings separates schizophrenic cases into two distinct groups: one which responds to anoxic shock and one which responds to insulin. The dysoxic type is distinguished by depression of mood, slowing of cerebration, apathy

and general underactivity; it includes psychotic depressions, paranoid schizophrenia, catatonic stupors, simple schizophrenia and some types of alcoholic hallucinosis without dementia. Anoxic shock appears to have a specific stimulating effect on these cases. The dysglycolytic type is distinguished by overactivity, elation, motor excitement and rich variety of bizarre delusions and hallucinations. It comprises the acute manias, hebephrenic and catatonic excitement and paraphrenias. Insulin appears to have a specific tranquilizing effect in these cases and influences the underlying thought disorder. In acute dysoxic cases, e. g. acute catatonic stupors, application once daily for the first five shocks is found to be the optimum frequency, followed by application on alternate days. In milder cases shock therapy on alternate days is usually sufficient. Remission is usually obtained after seven to ten shocks. In dysglycolytic cases a course of twenty comas is usually sufficient. Complete remission may be expected in 70 per cent of all cases, improvement in 15 per cent and failure in 15 per cent.

South African Journal Medical Sciences, Johannesburg

9:111-150 (Nov.) 1944

*"Prothrombin Response to Vitamin K Test" in Differentiation Between Intra- and Extrahepatic Jaundice. H. B. Stein.—p. 111.
Inhibitory Effect of Testis on Estrogen Sensitivity of Sex Skin of Male Baboon (Papio Porcarius). Christine Gilbert.—p. 125.
Study of Quantitative Interaction Between Estrin and Progestin in Rat. W. A. Odendaal.—p. 131.
Alum Precipitated Typhus Vaccine: South African Epidemic Typhus Vaccine Prepared from Gerbils (Genus Tatera). L. W. Osburn. —p. 143.

Intrahepatic and Extrahepatic Jaundice.—The response of the plasma prothrombin to intramuscular injections of 5 mg. of synthetic vitamin K has been shown to be of value in the differentiation between intrahepatic and extraheptic jaundice. Stein reports observations on 27 new patients, bringing the total to 50 patients. He suggests that the test be called the "prothrombin response to vitamin K test." Of a total of 45 cases of jaundice (excluding 5 cases of hepatic cancer) the test was correct in 43 cases. In 21 cases of obstructive jaundice an effective response (prompt or delayed) was obtained in all; in 24 cases of hepatocellular jaundice an ineffective response (partial or complete) was obtained in 22. The method of performing the test and the interpretation of the results obtained are examined in the light of the work of other investigators, and special attention is drawn to the following points not stressed by others: 1. A satisfactory method for estimating plasma prothrombin must be used. 2. Parenteral administration of vitamin K, preferably in doses of 5 mg., should be used. 3. A fixed initial prothrombin level must be obtained before injecting vitamin K, in order to exclude a spontaneous rise in the prothrombin level, e. g. in cases of acute hepatitis during the recovery phase. 4. The test is of limited application, as it is of value only in cases of jaundice with an initially low prothrombin level—preferably with a prothrombin index of less than 75 per cent. Cases of combined intrahepatic and extrahepatic jaundice may lead to difficulties in interpretation, namely primary or secondary liver cancer with metastases in the portal glands, and biliary cirrhosis following long standing obstruction of the bile ducts. Except for these difficulties the test is of great value in differentiating between "medical" and "surgical" jaundice.

Pediatria e Puericultura, Bahia

13:117-152 (March-June) 1944. **Partial Index**

*Poliomyelitis of Pseudomyopathic Form. M. Gesteira.—p. 117.
Quinine-Iodobismuthate in Therapy of Whooping Cough. G. O. de Paula Marques.—p. 139.

Pseudomyopathic Poliomyelitis.—According to Gesteira poliomyelitis of the pseudomyopathic type is characterized by sudden appearance of paralysis either after an infectious period typical for poliomyelitis or without such a period. Two or more members of the family become simultaneously ill, which is a rare occurrence in poliomyelitis. Early paralysis and consequent moderate atrophy are symmetrical and are regularly distributed in the proximal areas of the limbs, near the pelvic and scapulohumeral joints. There is a lordosis. The type of gait and posture is similar to that of myopathy. The hands become clawed or show a tendency to this deformity. In cases reported by the author the electrodiagnostic examination late in the course of the disease failed to show any reaction of degeneration, which suggests complete regression of paralysis.

Medizinische Klinik, Berlin

40:361-390 (June 23) 1944. **Partial Index**

Comment on Diagnosis and Treatment of Pancreas Necrosis and on Involvement of Pancreas in Cholelithiasis. F. Bernhard.—p. 361.
Roentgenologic Examinations During Pregnancy. A. Wiessmann.—p. 365.
*Immunization and Widal Reaction in Bacillary Dysentery. W. Schäfer. —p. 367.
Treatment of Malignant Tumors of Genitals in Women. R. K. Kepp. —p. 369.
Uncommon Forms of Encephalitis: Typhus Without Fever and With Fatal Encephalomeningitic Course; Transient Encephalomeningitis. L. M. Kugelmeier.—p. 372.

Widal Reaction in Bacillary Dysentery.—Schäfer examined serums for the presence of agglutinins in 150 soldiers who were immunized against bacillary dysentery. The Widal reaction was negative in 85, or 56 per cent. Serums in another series of 150 soldiers in the fall of 1943 were negative for agglutinins in 120 cases, or 80 per cent. The Widal reaction does not appear to be a satisfactory test of the immunizing effect of dysentery vaccines. The percentage of cases with agglutinins present in the serum was the same in immunized as in the nonvaccinated soldiers. A positive Widal reaction in soldiers not suffering from bacillary dysentery is not to be considered the result of immunization but suggests the existence of a ubiquitous causative factor. Latent infection with dysentery bacilli can play an important part. Since 1941, when the incidence of bacillary dysentery reached its height in the army, there has been a constant decrease in acute cases of bacillary dysentery, which was paralleled by a similar decrease in latent cases. Mass immunization of soldiers who have gone through several seasons of dysentery is not so necessary as for troops which have been brought for the first time from base areas to the battle front. Some secondary reactions to immunization such as diarrhea and pain in the joints or extremities are to be considered as specific allergic reactions against dysentery bacilli antigens in immunized persons with a latent infection.

Acta Medica Scandinavica, Stockholm

117:1-120 (April 17) 1944. **Partial Index**

*Reexamination of 79 X-Ray Treated Exophthalmic Goiter Patients Eight to Eighteen Years After Their Discharge. M. Bjørneboe.—p. 15.
Variation with Latitude of Steepness of Epidemic Curves of Poliomyelitis. H. Petersen.—p. 24.
Investigations on Content of Reticulocyte Ripening Substances in Plasma in Various Forms of Experimental Anemia. C. M. Plum.—p. 29.
Renal Rickets. J. Tomenius.—p. 43.
*Excretion of Hormones in Chronic Polyarthritis in Women: Sexual Function and Articular Disturbances in Women. H. Sjövall.—p. 69.
*Studies on Causation of Experimental Gastroprival Pellagra: III. Therapeutic Experiments on Pups with Preventive Parenteral Administration of Vitamin B_6 Given Together with Vitamin B_1, Lactoflavin and Nicotinic Acid Amide or Aline. S. Petri, F. Nørgaard, K. Trautner and W. Klaer.—p. 90.

Exophthalmic Goiter After X-Ray Treatment.—A total of 79 goiter patients were observed from eight to eighteen years after they had undergone x-ray treatment. Of the 71 considered in this report, 8 were later subjected to surgical treatment; 7 died, 12 are ill and 44 are well. The cause of death was thyrotoxic crisis in 2 and cardiac insufficiency in 4 cases. Of the 12 patients who were not well, 3 had cardiac insufficiency, 8 had a relapse of hyperthyroidism and 1 had myxedema. Slightly less than two thirds of the patients recovered with x-ray treatment. Reports on surgical treatment of exophthalmic goiter indicate a higher percentage of recovery, and the results are more rapidly obtained. The argument that x-ray treatment has no case mortality holds good only with certain reservations, for during the protracted treatment the patients are apt to die from thyrotoxic crisis or from the heart lesion.

Excretion of Hormones in Women with Polyarthritis.—Studies were made on 116 women with chronic polyarthritis and on 43 women with various orthopedic diagnoses. Attention was given to the relations between sexual function and joint disorders and a close connection was observed. The author stresses the high incidence of ovarian insufficiency in women with polyarthritis but does not believe that the separation of

cases of a menopausal arthralgic type is justified. The processes involved are complex, but it is probable that endocrine factors play an important role in the etiology of chronic polyarthritis.

Causation of Experimental Gastroprival Pellagra.—In studies on experimental endogenous gastroprival pellagra Petri and his associates attempted to elucidate the etiology by means of various elective resections of the digestive tract together with therapeutic experiments. The studies were made on dogs instead of pigs and revealed that vitamin B_6 is the only one of the B vitamins so far investigated by the authors (vitamin B_1, nicotinic acid and lactoflavin) which alone exerts a distinct therapeutic effect on experimental gastroprival pellagra; i. e., it exerts its effect independently of the stomach.

117:199-416 (June 2) 1944. Partial Index

Investigations on Physiopathology of Erythrocytes: I. New Technic for Study and Differentiation of Granular Erythrocytes. A. Nizet.—p. 199.
Spontaneous Hypoglycemia Referable to the Presence of Adenomas in the Islets of Langerhans. S. Lups.—p. 261.
*Protective Value of Intracutaneous and Percutaneous Methods of BCG Vaccination: Comparative Experimental Investigation. K. Birkhaug.—p. 274.
Behavior of the Nucleolar Apparatus During Growth and Differentiation of Normal Blood Cells in Adult Stage. B. Thorell.—p. 334.
*Can Rheumatic Infection Be Influenced by Artificial Tropical Climate? G. Edström.—p. 376.

Protective Value of BCG Vaccination.—Birkhaug says that, since it has been proved that BCG vaccine is harmless, attention must be concentrated on finding the best method for its administration. On the basis of an extensive survey and investigations he concludes that BCG vaccination performed either by the intracutaneous or by the percutaneous (multiple puncture or scarification) methods produces in guinea pigs a significant resistance against a virulent tuberculous infection. The multiple puncture BCG vaccination method produces the most potent resistance in guinea pigs. In nearly 5,000 children and adults the multiple puncture method produced 98 per cent positive tuberculin reactions with 1 mg. of old tuberculin in two months. An automatic apparatus performs forty punctures with one stroke. This multiple puncture method rarely produces a permanent blemish.

Rheumatic Infection and Artificial Tropical Climate.—Edström says that in 1941 one of the wards in the rheumatism department of the Lund Hospital was reconstructed into a tropical chamber; the air of the room has been kept at a constant temperature of 89.6 F. and its humidity at 35 to 40 per cent, a relatively warm but dry tropical climate. The ward beds were occupied during the past two years by 7 patients with rheumatic fever and 8 with chronic rheumatic polyarthritis. Of the 7 patients with rheumatic fever 6 became entirely free from symptoms and capable of working; 1 died of sepsis after an acute tonsillitis. Of the 8 patients with chronic polyarthritis 4 have become symptom free and capable of working. Two patients improved temporarily. One patient with a juvenile arthritis of the Still's disease type improved very much during the first treatment but after return to his home had a relapse, which could not be influenced by renewed treatment in the tropical ward. In 1 case the treatment was broken off on account of a mental depression. In 11 of the cases cultures from the throat at the beginning of tropical ward treatment showed hemolytic streptococci. In 9 of these cases the cocci disappeared during the stay in the tropical ward.

Acta Radiologica, Stockholm

25:1-80 (Feb. 29) 1944

*Roentgen Treatment of Carcinoma of Breast. H. Gylstorff-Petersen.—p. 1.
Carcinoma of Larynx and Hypopharynx: Roentgen Treatment and Results of Therapy. S. Mustakallio.—p. 13.
Experiences with New Method for Arthrography. K. Andersen.—p. 33.
Roentgenogram of Small Zenker's Pulsion Diverticulum in Various Phases of Swallowing. B. S. Holmgren.—p. 40.
Apparatus for Roentgenologic Examination of Stomach. Von Y. Seuderling.—p. 56.
*Studies on Relapses in Carcinoma of Uterine Cervix. S. Hultberg.—p. 59.

Roentgen Treatment of Carcinoma of Breast.—Gylstorff-Petersen reviews 601 cases of mammary carcinoma treated at the Radium Center in Aarhus between 1924 and 1936. Grouped according to Steinthal's classification, 25 per cent were in stage I, 59 per cent in stage II and 16 per cent in stage III. The five year survival percentages for the three groups were 43, 27 and 4 per cent respectively. The first stage patients operated on had a five year survival percentage of 73. Of the 308 patients given postoperative roentgen treatment 37 per cent survived more than five years. The author thinks that preoperative roentgen treatment is to be preferred to the postoperative. Of 113 inoperable patients treated by irradiation for carcinoma of the breast, 6 per cent were alive after five years' observation. The average age of the patients was 53 years. The results of the treatment were considerably poorer for those between the ages of 25 and 39 than for the older ones.

Recurrences in Irradiated Cervical Carcinoma.—Hultberg investigated the incidence of recurrences following irradiation of cervical carcinoma at the Radiologic Clinic in Lund, Sweden. Of 535 women who received irradiation during the period between 1927 and 1939, 281 obtained primary cure, but 90 of these later had a recurrence. The author discusses the possibility of reducing the risks of recurrences by means of extirpation of the uterus following irradiation and reports the results obtained with 16 patients who were treated by surgical intervention following irradiation. Twelve of these patients are alive and free from symptoms three and eight years after the operation. The microscopic examination of the tissues removed at the operation revealed in 7 cases cancerous residues in the cervix. In the remaining 9 cases no evidence of cancer could be established. The author suggests that more patients with cervical carcinoma should be operated on following irradiation.

Nordisk Medicin, Stockholm

21:45-84 (Jan. 7) 1944

History of Dicumarol. E. Jorpes.—p. 45.
Treatment of Arteriosclerosis with Potassium Iodide. V. Schmidt.—p. 49.

Hospitalstidende

Experimental Investigations on Significance of Various Regions of Stomach with Respect to Antianemic Principle in Liver (in Swine): II. Countereffect of Nicotinic Acid on Disappearance of Antianemic Principle in Liver on Resection of Fundus of Stomach. S. Petri, O. Bang, W. Kiaer and A. K. Nielsen.—p. 51.
Treatment of Schizophrenia with Acetylcholine Shock. Ruth Poort and A. Stigaard.—p. 55.
*Cases of Metastatic Ovarian Cancer with Primary Tumors in Gastrointestinal Tract. M. Winge.—p. 59.

Hygiea

Arthritis Deformans: Etiology and Treatment. I. Pathologic Anatomy. H. Bergstrand.—p. 61.

Metastatic Ovarian Cancer with Primary Tumors in Gastrointestinal Tract.—Winge discusses the structure and incidence of secondary carcinomas of the ovary in cases of primary tumors of the gastrointestinal tract. They are usually bilateral. The classic Krukenberg tumor contains abundant signet ring cells, but the lines of demarcation are vague. From 1937 to 1943 11 of these ovarian carcinomas, 1 a typical Krukenberg tumor, were seen in the Pathologic Institute of Bispebjerg Hospital, Copenhagen.

21:85-124 (Jan. 14) 1944

Present Problems in Treatment of Tuberculosis. J. Lundquist.—p. 85.
Bed Exercises in Prophylaxis Against Thromboembolism: Statistical Investigation in Puerperal Material. J. Mortens.—p. 93.

Hospitalstidende

*Anemia in Infectious Diseases. S. Dahl.—p. 99.
Arthritis Deformans, Etiology and Treatment: II. Fractures and Arthrosis Deformans. I. Palmer.—p. 103.

Anemia in Infectious Diseases.—Dahl says that in uncomplicated infectious diseases secondary hypochromic anemia, probably due to iron deficiency, occurs in from one fifth to one third of the cases; it occurs in complicated scarlet fever in 62.5 per cent of the cases. During an infection, a rise in sedimentation rate usually coincides with a fall in the hemoglobin percentage, and vice versa. When the sedimentation rate and hemoglobin percentage seem unrelated there is no anemia but at most a lowered hemoglobin content due to the patient's confinement to bed. Treatment of the anemia during the infection is apparently ineffective; when the infection subsides there is spontaneous recovery from the anemia.

Book Notices

Doctors at War. Edited by Morris Fishbein, M.D., Editor of the Journal of the American Medical Association. Cloth. Price, $5. Pp. 418, with illustrations. New York: E. P. Dutton & Company, Inc., 1945.

In some indefinite future, after the termination of the global war, the official histories of the Medical Services to our Army, Navy and Air Force will no doubt appear. Detailed, official, all embracing histories are contemplated. Previous medical histories of our wars repose on the shelves of the important libraries of the country, where they are consulted by specialists. Seldom are they perused by the doctor and probably rarely by any layman. For this reason "Doctors at War" is both timely and unique. The entire amazing story of the Medical Services to the Army, Navy, Air Force, industry and the civilian population is told here in a single volume by men who were largely responsible for the organization and the performance of the most gigantic task the medical profession of this country has ever been called to perform. Although dedicated to "the One Hundred and Eighty-Six Thousand Physicians of Our Country" it is written in a manner readily comprehended by the average reader. The volume was conceived, organized and edited by the veteran medical editor Morris Fishbein, who as chairman of the Committee on Information, Division of Medical Sciences, of the National Research Council came in contact almost daily with the various organizational phases of that task.

In the introductory chapter Dr. Fishbein presents a general outline and the scope of the task. The comparative figures compiled by Brig. Gen. Hugh Morgan speak for themselves. Thus, while the death rate in wounded in World War I amounted to 8.1 per cent it is only 3.3 per cent in World War II; meningitis mortality was 38 per cent in World War I and 4 per cent in World War II. The figures for pneumonia mortality were 28 per cent in World War I and 0.7 per cent in World War II. The annual death rate per thousand for all diseases in the Army, excluding surgical conditions, amounted to 15.6 per cent in World War I and 0.6 per cent in World War II. In the succeeding fifteen chapters the reader is privileged to follow step by step the history of the organization and the development of the medical units, the exciting recital of the heroic deeds on the battle front, the story of the important achievements and advances of preventive medicine, of the excellent work by the American surgeons working not infrequently under the very enemy fire.

Col. Leonard G. Rowntree, in the chapter "Fit to Fight," states that "war is a hard taskmaster but a great teacher. Medicine has learned much of the nation's strength, its steadfastness of purpose, its will to do, to win, to live and to be great and free. But it has learned also of the innumerable physical and mental defects, disabilities, disorders and diseases that now beset us. Let us hope that the lessons learned will not only have helped this nation to win the war but will also make us stronger and more productive in the postwar era."

The application of the newer knowledge in preventive medicine was made possible, according to Brig. Gen. James Stevens Simmons, by the combined efforts of the National Research Council, the Committee on Medical Research, the United States Public Health Service, the Bureau of Medicine and Surgery of the Navy, the Pan American Sanitary Bureau, the United States Department of Agriculture, the Coordinator of Inter-American Affairs, the American Red Cross, the International Health Division of the Rockefeller Foundation and most of the scientific institutions and societies in the fields of biology, medicine and public health. Problems investigated were those of nutrition, sanitation, protection against various infectious diseases in all the countries where American troops might be stationed, the Army's immunization and control of venereal disease, gastrointestinal diseases, the insect borne diseases and, in particular, malaria. Many of these problems were taken to the Division of Medical Sciences of the National Research Council and to the Committee on Medical Research of the Office of Scientific Research and Development, which arranged for the necessary investigations. The actual studies have been conducted by civilian doctors and scientists in the various laboratories and institutions of the country. The Committee on Medical Research has authorized, financed and supervised many projects for the Medical Department and has spent several million dollars in the search for answers to our problems. There have been hundreds of research projects dealing with different aspects of a wide variety of subjects, which include the control of infectious diseases, the discovery of new prophylactic and therapeutic agents against malaria and other tropical diseases, the discovery of effective insecticides and insect repellents, nutrition, fundamental studies of fitness and fatigue, transfusions and blood substitutes, shock, surgery, neuropsychiatry and aviation medicine. Extensive medical research is also being carried on through the Board for the Control of Epidemics, the Army Medical School and various laboratory and field installations of the Army.

Destruction of lice and the control of epidemic typhus became possible because of methyl bromide gas and the sensational new insecticide DDT. A striking example of the efficiency of the latter was demonstrated in Naples, when some two million civilians were deloused within a period of two months, thus checking the spread of epidemic typhus.

The low mortality of our wounded, we are told by Brig. Gen. Fred W. Rankin, was due to prompt surgical care by highly skilled specialists. It was made possible by a combination of two factors—the plan of medical service in the combat zone and the availability and proper utilization of young, formally trained medical officers. The plan of medical care in advanced battle zones was based on the principle that the sooner the wounded man receives adequate aid and subsequent definitive surgery, the more successful are the results. In addition, the full use of certain modern developments in medical therapy has played an important role in the establishment of that record. Among the most important of these are blood plasma and blood transfusion in the control of shock, chemotherapeutic agents such as the sulfonamides and penicillin in combating infection, newer methods in repair of injured nerves and defects of the skull and the treatment of chest wounds, abdominal wounds, vascular injuries and the like. On reading this brilliant account one cannot but agree with Major Gen. Paul R. Hawley that our army has the finest medical service of any army in the world. The cream of the American medical profession serve with our forces, and aiding them is a group of consultants, nationally known specialists in their own fields.

Dr. Thomas Parran contributes a most informative chapter on the work of the United States Public Health Service. On that service rests the prevention of epidemic disease, the control of venereal disease in and around the camps, the prevention of industrial disease and the assurance of the health of the American people.

Aviation medicine is practically a new branch. The story of how the flight surgeons "kept them flying" is told in a chapter by Major Gen. David N. W. Grant.

The performance of the gigantic task described in this interesting volume is summarized in the last chapter, on the streamlining of the medical research for war by the National Research Council for War.

The book is timely in that it presents in one volume all the exciting information that has appeared in bits in the various periodicals, both medical and lay, and because of useful information on the many civilian and governmental activities which all add up in attaining the victory over a powerful enemy.

Radiologic Examination of the Small Intestine. By Ross Golden, M.D., Professor of Radiology, College of Physicians and Surgeons, Columbia University, New York. Fabrikoid. Price, $6. Pp. 239, with 75 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1945.

The author introduces this subject with a brief outline of the indications for a radiologic study of the small intestine, a description of his method for carrying out this detailed study and discussion of the use of the small intestinal enema (Schatzki). There follows an account of the known facts of developmental anatomy of the small intestine graphically clarified by four excellent diagrammatic drawings of the stages of rotation of the intestine. He then describes the gross and microscopic anatomy of the small intestine, following with a clear presentation of the present knowledge of the physiology of the various components of the intestinal wall, including a discussion of the intrinsic nervous plexuses, the muscularis

mucosae and the chemical mediator theory of the neuromuscular and neuroepithelial mechanism of the intestine.

A chapter is devoted to the normal radiologic appearances of the adult small intestine from the standpoint of motility and mucosal relief patterns. Of particular interest is the description of the independent motion of the mucosa illustrated by reproductions of roentgenograms showing normal changes in size, shape and direction of the mucosal folds. The author then describes briefly the physiology of the infant's small intestine, pointing out that the segmentation of the barium-containing intestine and the paucity of well developed mucosal folds may be due to a lag in the development of nervous control generally characteristic of the infantile state, improving as reflexes change and develop until the familiar adult type of motor activity and mucosal pattern occur.

Following chapters on peritoneal adhesions and ileus with special mention of the role of hypoproteinemia in the production of ileus and detailed description of the indications for and use of the Miller-Abbott tube in the diagnosis and treatment of ileus, the author launches into a discussion of the alterations in the appearances of the small intestine in primary and secondary nutritional disorders. He describes the variable clinical, radiologic and pathologic manifestations of these disorders and illustrates his text with reproductions of films and photomicrographs of the small intestine from cases of advanced nutritional disorders. He emphasizes the nonspecific nature of the radiologic findings, showing that they may occur in varying forms both in neurogenic states and in organic disease. The clinical improvement obtained by appropriate vitamin therapy and other nutritional measures in primary and secondary deficiency states is correlated with illustrative radiologic studies of cases showing partial or complete restoration of normal small intestinal motor function and mucosal pattern. Sclerosing mesenteritis and other diseases of the mesentery are discussed in relation to nutritional disorders.

In regard to intestinal allergy the author describes provocatively tested cases, but he concludes that "a diagnosis of intestinal allergy cannot be made on the basis of the roentgen examination alone at the present time."

Regional enteritis and tuberculous enteritis are discussed and illustrated, emphasis being placed on the use of pressure films for demonstration of mucosal abnormalities of the terminal ileum.

Illustrations of benign tumors, intrinsic and extrinsic malignant epithelial neoplasms of the small intestine, and lymphosarcoma of the small intestine are taken from the radiologic and pathologic findings of appropriate cases.

Developmental anomalies and defects, both of the small intestine and of the peritoneum (volvulus, atresias, duplications of the intestine, multiple diaphragms, internal hernia and Meckel's diverticulum) are discussed, and several of these are illustrated with reproductions of x-ray films. Similar treatment is given by the author to the effects of foods, drugs and emotion on the small intestine as well as the effects of various parasitic disorders, particularly amebiasis.

The text is further enriched by illustrative radiologic findings in unusual conditions, such as simple ulcer of the ileum, enlargement of the ileocecal valve, amyloidosis of the intestine and cathartic abuse. The concluding paragraphs are devoted to a discussion of the unexplained findings of Hale and Schatzki in the small intestine of patients with scleroderma.

This book is a valuable contribution to the literature on intestinal radiology and warrants well the attention of the radiologist, the internist and the abdominal surgeon. The author's style is clear and concise, the illustrations are well reproduced and the entire content is well indexed for ready reference. The book is documented by an extensive bibliography, which is as much a commentary on the author's approach to this subject as his thorough painstaking method of radiologic examination of the small intestine.

Special Diet Manual: Diet Lists. Paper. Battle Creek, Mich.: Kellogg Company, [n. d.]

This "manual" consists of a large folder, on the leaves of which are printed lists of foods commonly used in the various types of special diets. Included among the diets is one for use in allergy to egg, wheat and milk and others designated salt free, high and low residue and high iron, as well as light, soft and liquid diets. The principles of high vitamin and diabetic diets are given. In another section foods are tabulated according to increasing carbohydrate content. The folder contains a large pad of printed sheets on which are listed a great number of foods with the caloric value of their average servings. It is intended that these sheets be marked by the doctor and given to the patient as a diet list. Their usefulness in this way is questioned because of the time required to search through the lists for the foods desired and more particularly because of the lack of personalization which is generally desired. This material can be recommended as best suited for quick reference on special dietary treatment and food values.

Casualty Work for Advanced First-Aid Students. By A. W. MacQuarrie, M.B., Ch.B. Cloth. Price, $1.80. Pp. 231, with 41 illustrations. Philadelphia: Peter-Reilly Company; Edinburgh: E. & S. Livingstone, Ltd., 1944.

The methods described in this convenient pocket book were developed to meet "blitz" conditions endured by the civilian population of Great Britain. While these methods differ somewhat from those taught in the usual first aid courses, their basic principles are the same. They presuppose a sound knowledge of anatomy and physiology and experience in first aid work. Emphasis is placed on (1) immediate control of hemorrhage, (2) immobilization of all badly damaged tissues and (3) rapidity of delivery to the care of the surgeon.

The book can hardly be recommended as a continuation of the first aid course taught in this country, but it may be useful to specially trained rescue squads of fire and police departments and of hazardous industries. Certainly one would not trust the administration of morphine and nikethamide to the layman even though the "dosage is regulated by the medical officer" except in unusual situations in which relief, in the absence of surgical aid, is imperative. Nor is any good purpose served by advising that if whole blood or plasma is not available when needed "a fluid such as glucose gum saline solution may be used." Differential diagnosis is encouraged probably too much—to distinguish between genuine shock and hysteria in the midst of disaster may baffle even the ablest surgeon; and it hardly seems appropriate to explain the difference between cerebral hemorrhage, embolism and thrombosis.

Original and doubtless of great value to rescue squads is the section on transportation of injured persons. The diagrams are simple and clear. There is a good index. An amusing English idiom is the advice to begin the feeding of a starved person "with fluids and slops."

On Modern Syphilotherapy with Particular Reference to Salvarsan. By Albert Neisser. [Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie, der Syphilologie und der Krankheiten des Urogenitalapparates, Band I, Heft 1, 1911.] Translated by Isabelle von Sazenhofen Wartenberg. Biography and Bibliography by Frances Tomlinson Gardner. Reprinted from Bulletin of the History of Medicine, Volume XVI, Number 5, December, 1944. Boards. Price, $1. Pp. 42, with portrait. Baltimore: Johns Hopkins Press, 1945.

This interesting volume is reprinted from the *Bulletin of the History of Medicine* (**16**:469 [Dec.] 1944). Our California colleagues deserve sincere appreciation for emphasizing Neisser's contributions to venereal disease control, not only with relation to gonorrhea, but also of practical advantage still in syphilis.

Albert Neisser (1855-1916) was born near Breslau, where he took his degree in medicine in 1877. Two years later in Simon's Dermatology Clinic he had isolated the micrococcus of gonorrhea, which he named the gonococcus in 1882, when he became head of the Polyclinic. After work with leprosy he became interested in syphilis and went to Java to study the experimental disease in monkeys. Here he discovered the responsible organism but had been anticipated by Schaudinn at home. In 1907 Neisser joined Wassermann in studying an application of the serum complement reaction to the diagnosis of syphilis. In 1909 Neisser worked with Ehrlich. The present contribution, first given in 1911, is the result of this clinical experience with syphilis. In 1912 Neisser fractured his hip and later developed diabetes, from which he died. As Mrs. Gardner says, "It was Neisser's fate to perform too well too soon." His 141 contributions, in German, French, and English, are testimony to his professional devotion.

Mrs. Wartenberg's translation is clear and well worth reading by all interested in modern methods of syphilotherapy. Neisser insists on "energetic treatment in the period immediately following infection." Neisser claims to have proved that mercury is a spirocheticide. Accordingly, he insists on using mercurial preparations in conjunction with the new organic arsenicals, in particular arsphenamine as introduced by Ehrlich. He discusses toxic reactions to arsphenamine, with particular reference to nerve injury. Neisser offers a detailed discussion of his technic for treatment and emphasizes "several courses of treatment throughout three or four years, whether or not there are any symptoms."

Were Neisser still alive, he would undoubtedly be showing enthusiasm now for "rapid treatment methods." He would probably reach the same conclusion as he did in 1911: "Human indolence and stupidity will arrange that syphilis will never die out but will remain always a dangerous disease, but we know that new and wonderful weapons have been placed in our hands to combat it."

Dietética infantil. I: Alimentación del hiño sano. II: Alimentación del niño enfermo. Por el Dr. José Espinasa Masagué. Monografías médicas "Balmis," 13. Paper. Price, 12 pesos per set. Pp. 191; 319. Mexico, D. F.: Compañía General Editora, 1944.

This book, in two volumes, is one of the "Monografías Médicas Balmis." It is an outline of the modern conceptions on dietetics of newborn infants and infants, with advice for the selection of proper food in accordance with the age of the infant and his condition either normal or in the course of diseases. The first book contains an introductory chapter on food and its constituents. The subject of vitamins is well discussed. In the other four chapters of the book the author deals with lactation, either natural or artificial, food after weaning, and technic in feeding normal infants. There are several tables with equivalents of food and formulas for preparation of artificial feeding and of food after weaning. In the second volume the author discusses infant feeding of premature infants and of infants either with abnormalities of the lips or normal but in the course of various diseases, especially diarrhea, gastric, cardiac and urinary diseases, acute and subacute infections, typhoid, anemia, convulsions and avitaminosis. The book is of value for physicians early in their building up of a pediatric clientele.

Nutrition with Sense. By Eleanora Sense. Cloth. Price, $2. Pp. 222, with illustrations by the author. New York: M. Barrows & Company, Inc., 1944.

In this compact little book much useful information and advice are found. The author covers nutrition from all aspects important to the householder. The early chapters provide simple accurate discussion of such fundamentals of nutrition as the place and function of carbohydrates, fats, proteins, vitamins and minerals in the diet. These terms are translated into foods as eaten, and up to date information is given on the effects of preparing and cooking. The nutritional facts throughout are presented simply and accurately. Problems of buying foods and their preparation for the table are considered, with rules for the proper cooking of various types of foods. Weekly menus are suggested for different seasons of the year, and a large portion of the book is devoted to recipes and directions for cooking. A limited number of tables giving nutritional value of foods are found at the end of the book. The criticism is made that in some instances the author goes beyond the bounds of normal nutrition by discussing nutritional therapy of disease conditions. This is scarcely warranted in this type of book. Otherwise the presentation can be recommended as excellent in outlining the facts of nutrition and guiding the student or housewife in the attainment of good nutrition.

The Examination of Reflexes: A Simplification. By Robert Wartenberg, M.D. Foreword by Foster Kennedy, M.D. Cloth. Price, $2.50. Pp. 222, with 7 illustrations. Chicago: Year Book Publishers, Inc., 1945.

At last the long awaited clarification of clinical reflexes has been achieved by a student of the nervous system. The multiplicity of reflexes named after their discoverers and rediscoverers and the confusion of a welter of classifications of reflexes has for too long been accepted uncritically. The author cuts through authoritative tradition and states a few unquestionable principles of reflex action. He then describes simply and accurately each clinical reflex and discards the accumulated junk of terminology based on different points of elicitation of the same reflex and the vanity of "discoverers." He ends his task with a simple but often unheeded statement: "Each new observation in clinical neurology should be subjected to a strict physiological interpretation." The book contains 465 references in the bibliography and detailed subject and author indexes. The book represents a vast store of knowledge based on clinical experience and a painstaking perusal of the literature. Its contents are based on sound physiology and should be carefully studied by all neurologists. The volume is a much better reference work for students of reflexes than most textbooks that have uncritically handed down errors from their precursors. It is a refreshing monograph and is highly recommended.

The New York Hospital: A History of the Psychiatric Service 1771-1936. By William Logie Russell. Cloth. Price, $7.50. Pp. 556, with illustrations. New York: Columbia University Press, 1945.

This book tells an interesting story of the psychiatric service in New York from 1771 to 1936, starting with an account of the earliest provisions for the treatment of the mentally ill in the state of New York. The story gradually develops into the building of the first hospital with its department of psychiatry, then the founding of the Bloomingdale Asylum, the state supervision and law, followed by the expansion of modern scientific psychiatry at Bloomingdale. This book is one of the best of its kind. It should be purchased by every psychiatrist, neurologist, psychiatric nurse and social worker. It will serve as an excellent guide regarding the various problems of mental illness as well as an excellent reference work for teaching.

The Human Body. By Logan Clendening, M.D. Fourth edition. Cloth. Price, $4. Pp. 443, with 106 illustrations by W. C. Shepard and Dale Beronius and from photographs. New York: Alfred A. Knopf, 1945.

The Human Mind. By Karl A. Menninger. Third edition. Cloth. Price, $5. Pp. 517, with illustrations. New York: Alfred A. Knopf, 1945.

These two books have been among the most successful of their type, having been purchased by many thousands, if not hundreds of thousands, of people. Dr. Clendening was able to revise his book before his untimely death, thus making a good book even better. Dr. Menninger has prepared a complete revision of his book with the assistance of many of his associates. It is an interesting work, adapted to persons preferably above high school age. The advances in psychiatry resulting from the extensive experience of the war have been incorporated.

The Neurologist's Point of View: Essays on Psychiatric and Other Subjects. By I. S. Wechsler, M.D. Cloth. Price, $3. Pp. 251. New York: L. B. Fischer, 1945.

Many of the chapters of this book have appeared in other publications, some quite outside the field of medicine, like the Menorah *Journal*. The author's interests extend from the neuropsychiatric problems peculiar to the Jewish people to the eternal conflict between the individual and society. There is a striking chapter on Sigmund Freud, with the conclusion that psychoanalysis will be remembered longest for the insight into normal and abnormal behavior which it has vouchsafed. A chapter entitled "A Brief History of Psychiatry" indicates a belief in a lessened incidence of hysteria and the opinion that the neuroses now develop on a higher psychic level than formerly because of changes in social and cultural conditions.

Poet Physicians: An Anthology of Medical Poetry Written by Physicians. Compiled by Mary Lou McDonough. Cloth. Price, $5. Pp. 210. Springfield, Illinois: Charles C Thomas, 1945.

Here are collected a variety of poems of interest to physicians and all of them by physicians. There are brief biographies of each of the poets concerned. The poems have been chosen largely for their medical flavor, although many physicians have written poetry quite outside the field of medicine. Such distinguished names as those of Sir Henry Head, Havelock Ellis, Sherrington, Oliver Wendell Holmes, Keats and Percival, the British laureate Robert Bridges and the immortal John McCrae set the tone of the entire volume. The book is supplemented by a cumulative index of poet physicians, some of whom might better be characterized simply as rhymsters. The book is a valuable addition to literary medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ANOCIASSOCIATION AND TREATMENT OF SHOCK

To the Editor:—**I would greatly appreciate obtaining an authoritative appraisal of the work of the late Dr. George Crile as embodied in his book "Anoci-Association." Certain views were originally challenged by Dr. Cannon, yet I have the impression that theories on shock and management by transfusion are essentially original with Dr. Crile and that his work is being sustained. Modern writers do not seem to quote the contributions of Dr. Crile, and it was somewhat of a surprise to note that a recent article by Dr. Phemister in The Journal discussed at length the nociceptor mechanism.**

George F. Fasting, M.D., New Orleans.

ANSWER.—Crile and Lower in their book entitled "Anoci-Association," published in 1914, make the following statements: "From all of these observations we concluded that the ideal treatment [of shock] would be to fill the blood vessels with some fluid which would not pass through the vessel walls, would cause no chemical injury, would carry oxygen, and would always be immediately available. Human blood is the only fluid which possesses all of these qualifications." The experimental research referred to was first reported in the *Boston Medical and Surgical Journal* in 1908 (**158**:961). The experimental details were published in Crile's book "Hemorrhage and Transfusion" in 1909. In this book it is concluded that "transfusion is a better form of treatment for shock alone, or combined hemorrhage and shock, than any other known form of treatment." He even suggested that a transfusion prior to operation has prophylactic value, which procedure has recently been advocated in the presence of a moderate anemia or an anticipated blood loss during the operation.

Crile in "Hemorrhage and Transfusion" presented experimental evidence demonstrating the occurrence of hemoconcentration. As early as 1904 (*Am. J. Obst.* **2**:106, 1904) he stated "That is to say, the blood is transferred to the venous side. . . . The patient has been bled in his own vessels." This statement was based on his experiments on shock reported in 1899 (Surgical Shock, J. B. Lippincott Company), in which he reported the existence of an elevated venous pressure in traumatic shock. In this monograph he reported a decrease in "cardiac output," which was inferred chiefly from the pulse pressure record, and proposed his vasomotor exhaustion theory of the cause of shock. This concept was broadened in the book "Anoci-Association" into the "kinetic theory of shock." This hypothesis maintained that every adequate stimulus awakens associations, or "an ontogenetic or phylogenetic memory." These associations may be injurious, i. e. nociassociations, and it is the constant effort of the individual to reach a state of anociassociation. Noxious stimuli, traumatic or emotional, or noxious conditions, hemorrhage, infection, starvation, muscular exertion, cause "discharges of energy," which "when intense enough, produce extreme conditions called 'exhaustion' and 'shock.'" This theory was then applied to "the development of the shockless operation through anociassociation." The patient was protected from emotional strain prior to and after the operation, the anesthetics were selected to exclude all stimuli from the brain, and the tissues were handled gently.

John Scudder in his book on shock (J. B. Lippincott Company, 1940) provides an excellent synopsis of the history of the signs and symptoms, the theories and the treatment of shock. A perusal of this book will reveal that all of the observations made in 1899 and 1909 by Dr. Crile had been made before; even blood transfusion for "shock" had been suggested by Heister as early as 1750 and had been used by John Hunter in 1776 and F. Jordan in 1881. But no one prior to Crile had investigated the subject of shock so extensively. Further, Crile placed blood transfusion on the therapeutic map, not only for shock and hemorrhage but for other conditions. However, it was the work of Landsteiner (1902) on blood groups and the development of the Kimpton-Brown tube method (1913), the syringe method (Unger 1915) and the sodium citrate method (Lewisohn, 1915) that rendered the use of blood transfusion widely applicable and utilizable in World War I. Crile made an outstanding contribution to the prevention of shock by teaching the importance of a proper preoperative and postoperative environment, of the selection of the appropriate anesthetics, and of gentleness in the manipulation of tissues.

His theory that shock is due predominantly to an exhaustion of the vasoconstrictor center has not withstood careful experimental analysis. The evidence indicates that this center remains reflexly active and perhaps hyperactive during the development of shock (Grodins, F. S., and Freeman, Smith: *Internat. Abstr. Surg.* **72**:1, in *Surg., Gynec. & Obst.*, January 1941). However, numerous investigators hold that either a decrease in vasoconstrictor tone or reflex arteriolar dilatation causes what is called primary shock or a moderate fall in blood pressure, from which recovery occurs spontaneously or which responds readily to treatment. The author of this answer holds with C. J. Wiggers (*Physiol. Rev.* **22**:111 [Jan.] 1942) that "extensive reflex arteriolar dilatation may occur as an incipient reaction during many catastrophes which lead to shock" and that "it should no longer be considered a sin to give thought to the possible role that the vasomotor center may play in determining the lethal character of peripheral circulatory failure." N. E. Freeman ("Burns, Shock, Etc.," Military Surgical Manuals, National Research Council, W. B. Saunders Company, 1943, vol. 5) says that "on the basis of clinical experience it is generally agreed that pain is a factor in the production of shock. Possibly the necessary use of anesthesia, in animal experimentation, so changes the physiologic reactions that shock cannot be produced by pain alone. . . . It seems likely, therefore, that the emotional state may play a significant part in the production of shock. Objective proof of this concept, however, is difficult to obtain."

Phemister (THE JOURNAL, April 28, 1945, p. 1109) properly emphasizes the view that a reduction in circulating blood volume is a more important factor in the genesis of shock due to tissue damage than nociassociations, according to existing evidence. His conclusion that blood and plasma transfusions irrefutably constitute the most effective treatment of shock confirms the statement made by Crile in 1909.

ELECTROMYOGRAMS OF TREMORS

To the Editor:—**In The Journal Feb. 28, 1942, Dr. DeJong published the tracings of the tremor of paralysis agitans and of some fibrillations. Are there similar tracings of senile tremor, tremor of excitement or intention tremor also in the literature?**

George H. Hoxie, M.D., Berkeley, Calif.

ANSWER.—No tracings of the specific tremors described in the query are available in the medical literature. Tremors of this type, however, have been recorded many times in laboratories, and electromyograms of the tremors in cerebellar diseases, athetosis and Sydenham's chorea have been published. New Work on the subject is about to be published in the *Archives of Neurology and Psychiatry*. This paper will give the electromyograms of patients suffering from neuroses precipitated by combat, and these will be contrasted with the tremors shown in Parkinson's disease, delirium tremens and the psychoneuroses of civilian life.

References:

Hoefer, P. F. A., and Putnam, T. J.: Action Potentials of Muscles in Rigidity and Tremor, *Arch. Neurol. & Psychiat.* **43**: 704 (April) 1940.

Hoefer, P. F. A., and Putnam, T. J.: Action Potentials of Muscles in Athetosis and Sydenham's Chorea, *ibid.* **44**: 517 (Sept.) 1940.

Brazier, M. A. B.: Tremors in Combat Neuroses: A Comparison with the Tremors of Parkinson's Disease, Delirium Tremens and the Psychoneuroses of Civilian Life; Electromyographic Studies, *ibid.*, to be published.

ALCOHOL AS A STERILIZING AGENT

To the Editor:—**Please give me information concerning the efficacy of alcohol as a sterilizing agent. For example, when a tube of catgut has been opened and partly used, is it safe to put the remainder in a covered dish of alcohol and expect it to remain sterile? Again, for ordinary skin preparation and wiping prior to removing sutures or giving hypodermic injections, is the ordinary rubbing alcohol which contains some castor oil and some brucine as good as pure alcohol? Of course it is much cheaper for office and hospital use.**

John H. Duncan, M.D., Sault Ste. Marie, Ont.

ANSWER.—Ethyl alcohol is an efficient disinfectant in certain concentrations. The most efficient strength is 70 per cent by weight (Price, P. B.: Ethyl Alcohol as a Germicide, *Arch. Surg.* **38**:528 [March] 1939). It is useful against contaminating organisms as well as the ordinary resident bacterial flora of skin (Price, P. B.: New Studies in Surgical Bacteriology and Surgical Technic, THE JOURNAL, Nov. 26, 1938, p. 1993). It is perhaps the best available agent for ordinary skin preparation and wiping prior to removing sutures or giving hypodermic injections. The solution should be properly prepared.

Alcohol is much less effective, however, in sterilizing catgut. It has been shown conclusively that alcohol will not sterilize raw catgut. One reason for failure is that the alcohol does not

come into contact with many organisms harbored in the cracks and folds of the strand. Another reason is that alcohol is ineffective against spores. Unquestionably a strand of heat sterilized catgut taken from a tube can be kept sterile in a covered dish of alcohol, but there is always a chance that the catgut may have been contaminated by handling or from the air, and there is no assurance that alcohol will completely counteract the contamination.

Many preparations of rubbing alcohol are in use. It is probably safe to say that most of them have relatively little skin disinfectant action. The concentration of alcohol in these preparations is usually too weak to be germicidal. After all, the primary purpose of "rubbing alcohol" is not to disinfect skin and it should not be expected to be a satisfactory substitute for germicidal preparations of alcohol. Brucine probably does not add anything to the disinfectant action of rubbing alcohol, and castor oil may actually lessen its germicidal effect. "Pure" alcohol is less effective than the 70 per cent, by weight, solution.

OLIGOSPERMIA AND STERILITY

To the Editor:—**A white man aged 29 has oligospermia. He is in excellent health: his Hinton reaction is normal, as is his basal metabolic rate. He reported his last sperm count as 28 million per cubic centimeter; I did a recount and found 26 million. After a series of injections of antuitrin, the sperm count was found to be 12 million. Very much to my surprise, he told me that he had a 3 year old son who is in good health. When his wife did not become pregnant again after two years, both were checked and his condition was detected. Is it possible to have children with such a low sperm count, especially considering the fact that the motility of the sperm is very poor, and a high percentage of pathologic forms are present? If it is not possible to have a child with such a count, how can the change be explained since the patient has had no illness whatever since the last baby was born except an occasional cold?**

M.D., Massachusetts.

ANSWER.—Moderate oligospermia is not inconsistent with fertility if the volume of the ejaculate is adequate and the motility and morphology of the spermatozoa are good. S. T. Meaker (Human Sterility, Baltimore, Williams & Wilkins Company, 1934) stated that pregnancy is improbable with sperm counts of less than 60 million, but he has since revised his opinion in favor of counts considerably lower. Poor motility inherent in the spermatozoa would be a serious fault; most cases of so-called necrospermia, however, are due to the fact that the specimen was not obtained and transported under ideal conditions. A high percentage of pathologic forms, on the other hand, present direct evidence of male infertility, all the stronger when the count is low.

The overall picture in this case is one of fertility so depressed that pregnancy, while not impossible, is definitely unlikely. It may well be that three years ago the semen was in all respects normal. Remarkable changes in male fertility, both for the better and for the worse, sometimes occur in a short space of months and without any reason immediately apparent. One must suppose that in cases of deterioration either the gonadotropic action of the anterior pituitary has diminished or the seminiferous tubules have become less responsive to stimulation. These phenomena may take place without obvious relation to the patient's general health.

A testicular biopsy would be informative. If this shows atrophy of the germinal epithelium, the outlook is unfavorable. In the absence of atrophy, attempts may be made to stimulate spermatogenesis. The first step should be a thorough survey of the patient's health and hygiene, with particular reference to such items as chronic focal infection, anemia, sex habits, diet, exercise and rest. Gonadotropic therapy is rational in theory though often disappointing in practice. The best results have been obtained from the combined use of pituitary and chorionic gonadotropins.

MEGAKARYOCYTES IN THROMBOPENIC PURPURA

To the Editor:—**Are there any reliable methods for the determination of megakaryocytes in bone marrow? Are megakaryocytes increased in thrombopenic purpura? Can the response to splenectomy be predicted from the number of megakaryocytes?**

Philip Pizzolato, M.D., New Orleans.

ANSWER.—The number of megakaryocytes can be counted in a certain standard area on a stained bone marrow film (Limarzi and Schleicher: THE JOURNAL, Jan. 6, 1940, p. 12) or the number can be determined in the counting chamber while making the usual total nucleated cell count. Both methods give only approximate values, as the quantitative estimation of any bone marrow cells by the puncture technic is open to considerable error. It usually suffices to know whether the megakaryocytes are increased, normal or decreased, and this information can be obtained from an examination of the bone marrow film under the low power objective. Each individual must familiarize himself with the normal number of megakaryocytes for the special technic employed. In thrombopenic purpura the megakaryocytes in the bone marrow are either normal or increased in numbers. It has not been established that the response of the platelets to splenectomy can always be predicted from the number of megakaryocytes. However, one should hesitate to remove the spleen of a patient in whom the megakaryocytes are definitely diminished or absent.

SUBCUTANEOUS AND INTRAMUSCULAR TEMPERATURE RESPONSE TO EXTERNAL STIMULATION

To the Editor:—**Kindly furnish me with references concerning the penetrating effects of hot or cold baths on an extremity. In other words, what is the temperature at various depths beneath the skin after an extremity has been immersed in a bath of definite temperature for a definite time?**

M.D., South Carolina.

ANSWER.—Determinations of the temperature changes produced within the living human extremities on exposure to hot and cold baths do not seem to have been made. However, such observations have been recorded for the temperature alterations from the application of the hot water bag and of the ice bag to the living human calf. Following the application of a hot water bag the skin surface temperature rose from 90 F. to a maximum of 110 F. within thirty minutes. The subcutaneous temperature rose from 91.2 F. to 105.5 F. in forty minutes and the intramuscular temperature (at a distance of about 2 inches beneath the skin surface) from 94.2 F. to 99.6 F. after fifty minutes. On the application of an ice bag the skin temperature fell to 43 F. in fifteen minutes, the subcutaneous temperature went to 70 F. in one hour and the intramuscular temperature to 79 F. after about two hours. While water is a more efficient agent for conductive heating or cooling, it appears reasonable to assume that the temperature changes described are of the same order as those taking place on the direct application of hot and cold water.

Reference:

Bierman, William: Physical Medicine in General Practice, New York, Paul B. Hoeber, Inc., 1944, pp. 5-7.

PENICILLIN AS PROPHYLAXIS TO POSTOPERATIVE INFECTION

To the Editor:—**Would local and parenteral administration of penicillin be advisable as a prophylactic against infection and following cataract operation?**

M.D., Louisiana.

ANSWER.—No. Penicillin is of value only in case the infection is due to an organism susceptible to the drug and then only when the blood and tissue concentrations of the drug are kept at a high level. It is obviously impossible to foretell what might be the infecting organism. Furthermore, intraocular infection following cataract extraction can be completely prevented by sterilization of the conjunctival sac before operation and by scrupulous asepsis during the operation.

WIRING IN FRACTURES OF THE JAW

To the Editor:—**Who developed multiple loop wiring in fracture of the jaw? When was it first described?**

Daniel Klein, Major, M. C., A. U. S.

ANSWER.—The principle of wiring the teeth in the upper and lower jaw as a means of fixation of fractures of the body of the mandible was first described by Thomas L. Gilmore in 1887. Multiple loop wiring, a modification of the Gilmore technic, was first described by R. T. Oliver in 1910 in an attempt to standardize the various methods employed.

References:

Gilmore, T. L.: *Archives of Dentistry* **4**: 383, 1887.
Oliver, R. T.: A Method of Treating Mandibular Fractures, THE JOURNAL, April 9, 1910, p. 1187.

IMMUNITY TO PNEUMONIA

To the Editor:—**I should like to know whether recovery from an attack of pneumonia of a known type confers immunity against a subsequent attack of that same type of pneumonia.**

Frederick G. Murray, M.D., Cedar Rapids, Iowa.

ANSWER.—Demonstrable specific immunity does occur after an attack of pneumococcic lobar pneumonia, but it is of brief duration. Finland and Winkler (*Am. J. M. Sc.* **188**:309 [Sept.] 1934) mention 4 instances in which two attacks caused by pneumonia of the same type occurred within a year. Recovery from an attack of pneumococcic pneumonia, therefore, may not confer immunity against a subsequent attack.